

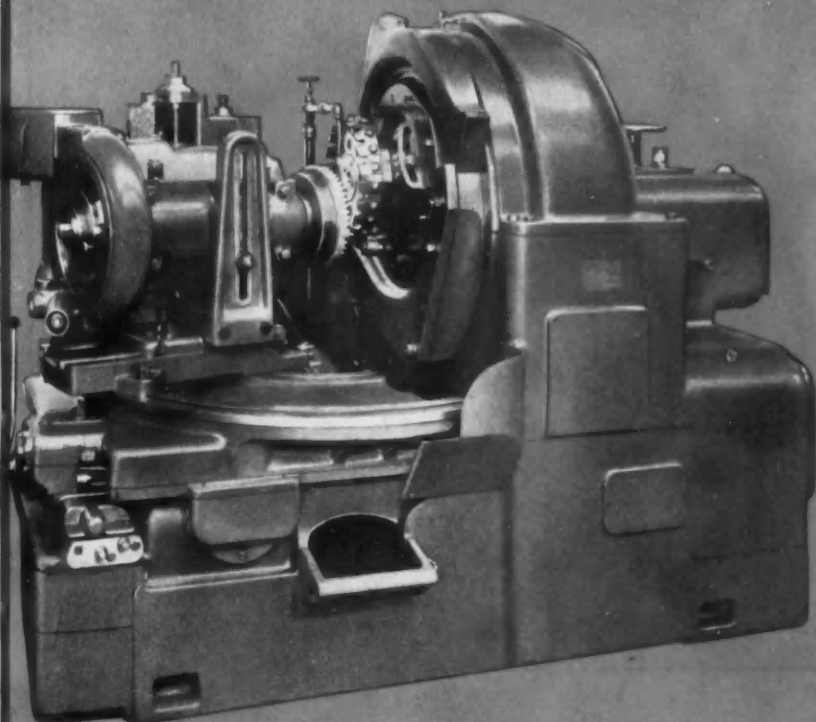
THE IRON AGE

DUCTION -- MANAGEMENT

MARCH 29, 1934

PROCESSES -- NEWS

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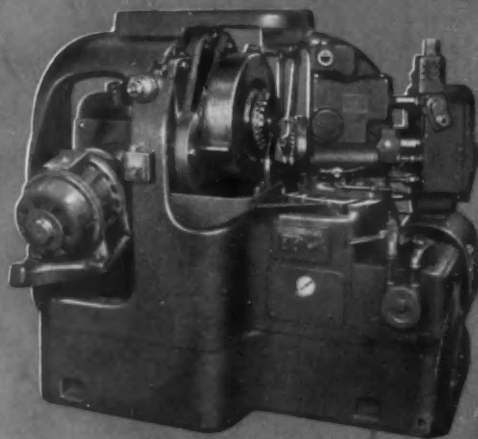


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THE IRON AGE

ESTABLISHED 1855

MARCH 29, 1934

Vol. 133, No. 13

Common Sense Applied to Price Levels

"Washington has been intrigued by that wretched device of the statistician, the index of wholesale commodity prices. It is so eager to get prices up that it does not seem to inquire very particularly what prices go up."

—Dr. O. M. W. Sprague

THE man who invented dynamite had something in common with the man who invented the index number system for recording price levels. Each of them evolved a valuable product capable of doing great harm when improperly used.

Dynamite is a useful aid to constructive progress. And so, too, are index numbers in skilled and understanding hands. Unfortunately the index of commodity prices has escaped from the statistical arena where it belongs and has been running wild of late. Statesmen, politicians, social and monetary reformers and countless enthusiastic "new dealers" speak glibly of the price level of 1926 and of the desirability of restoring it. Countless millions of Government money are being spent for this purpose, to say nothing of

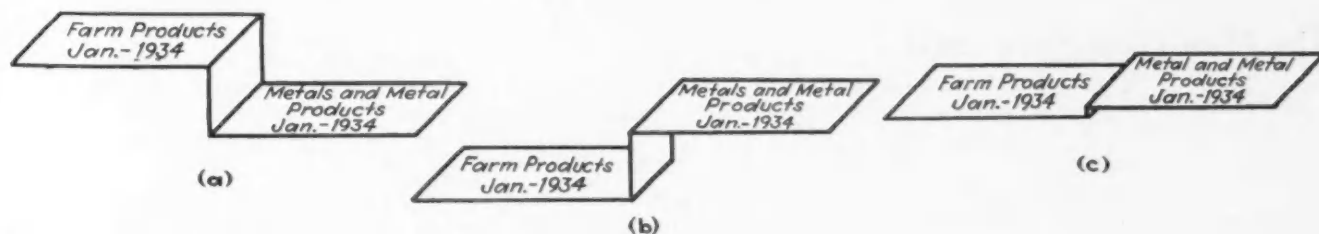
By JOHN H. VAN DEVENTER

Editor, The Iron Age

the billions involved in the devaluation of the gold dollar which has the same general end in view.

It is safe to say that ninety-nine out of every hundred "pronouncers"

who utter profound statements concerning price levels and what they should be would not recognize a real price level if they met one face to face. As a matter of fact, there is no such thing as a price level. The peaks and valleys of the Himalayas have no more variety than have the prices of the various commodities and products of American industry and agriculture. Furthermore, the Himalayas "stay put" from week to week and from year to year, which cannot be said of commodity prices. Averaging the peaks and valleys of the Himalayas and expressing this as an altitude "index number" would not give the general



Figures Can't Lie, But—

You can make almost any one of the various price group levels look high or low according to the year that you choose to equal 100. Let's take the prices as of January, 1934, of two groups and look at them from the viewpoint of three different bases.

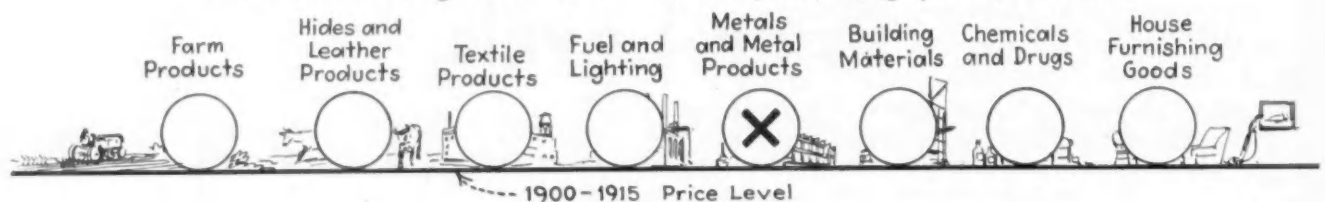
- If you want to show that present farm product prices are high, with respect to metal products, choose 1900 as the base year with index of 100. Here is what you get.
- If you want to show that current farm prices are low as compared with metal products, choose 1926 as the base year. Then you will reverse the order.
- And if you choose the 16-year average from 1900 to 1915, incl., as a base, this is the picture of current farm and metal product prices. Almost even.

The Great American Balloon

Instead of taking 1926 as a base for observing price fluctuations between groups, suppose we take the average of the period from 1900 to 1915, inclusive. This is the most logical base, being a 16-year average of the long term period before war influences upset things. Look at what happens in the great American balloon race, when prices reach for the ceiling. And note, especially, "X," which marks the spot of the metals and metal products group.

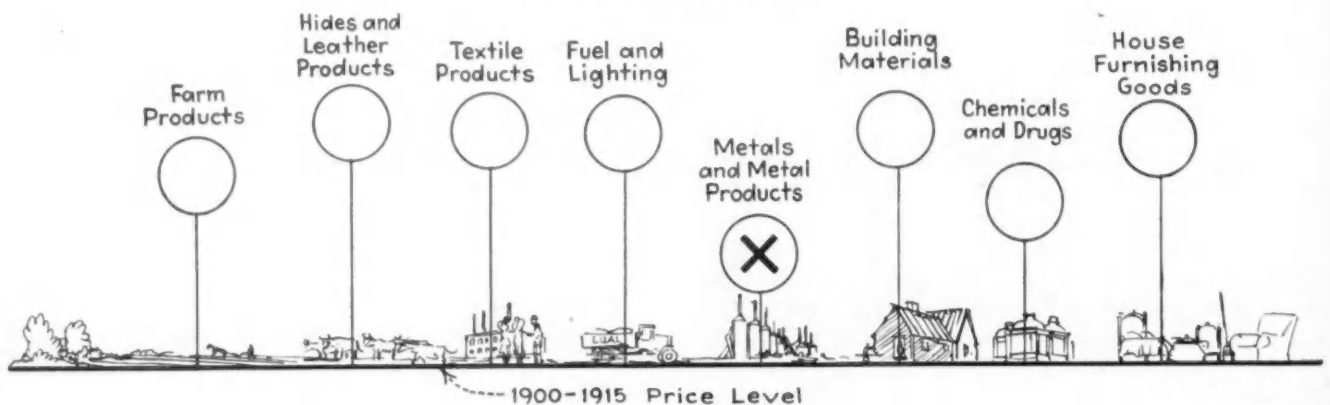
Before the Race Began

All contestants are "grounded" on the 1900-1915, incl., average price level of 100.



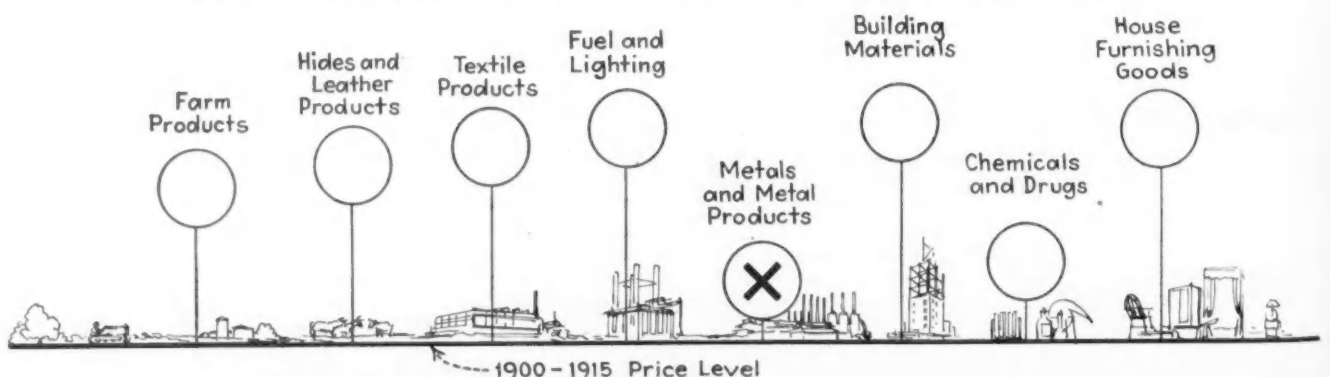
Going Up!

World War influences send up the price group balloons. But some go higher than others. This picture represents price averages for 1916 to 1925, inclusive. (Note the "X," which marks the spot.)



The New Deal Price Ideal

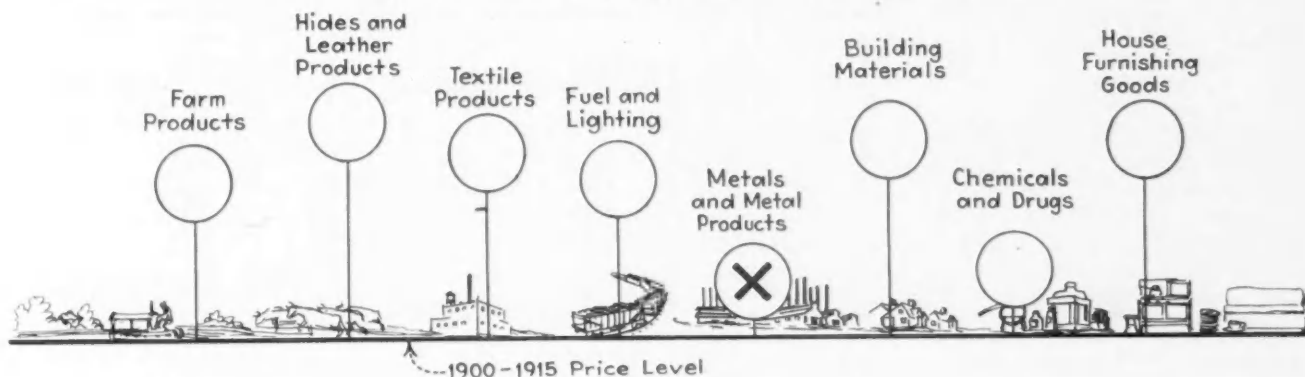
A picture of 1926 price group levels as viewed from the 1900-1915, inclusive, base. This is the position in which "new deal" economists would "freeze" price relationships. Two groups appear to be out of luck. ("X" marks the spot of one of them.)



Race of Price Groups

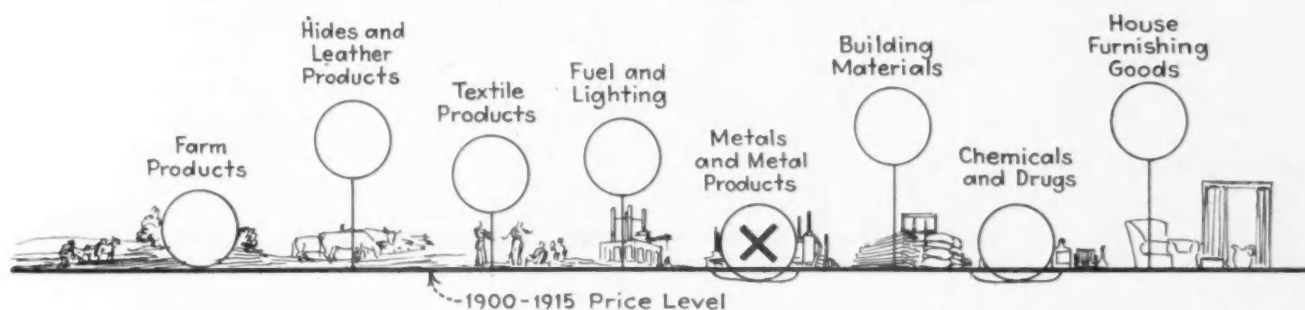
The Gas Is Leaking

The price balloons are coming down, even in the "boom" period of 1927 to 1929, of which this picture represents the average. Some groups haven't as far to fall as others, not having risen to such dizzy heights. ("X" again marks the spot.)



Price Deflation in Earnest

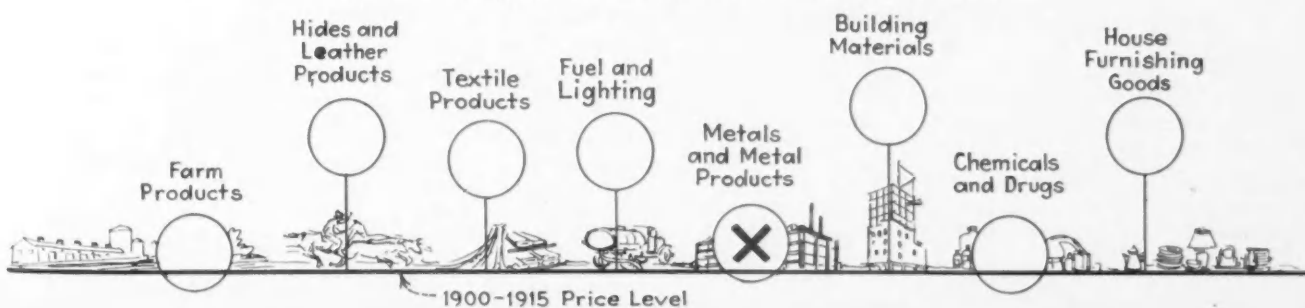
In fact, two balloons have gone down below the 1900-1915 ground level. This is what happened during the deflation period of 1930-1933, inclusive.



And in January, 1934

—which is virtually today, as statistics go, here is the picture. ("X" still marks the spot of the metals and metal products group.)

And now, compare this picture with that shown at the bottom of page 17, if you believe that figures cannot do otherwise than tell the truth.



For the Statistically Minded—

The following tables give the statistical data on which the accompanying study is based. The larger table below shows price levels as computed by the Department of Labor on the accepted base of 1926 = 100. The smaller table below shows the period averages for the various groups with indices transposed to the base of the 1900-1915 incl. average 100. This is done by simple arithmetical proportion, and can be easily checked by anyone interested in doing so.

Wholesale Price Indices, Base, 1926 = 100

(LONG-TERM PRE-WAR PERIOD, 1900-1915, INC.)

Year	All Com- modities	Farm Products	Hides and Leather Products	Textile Products	Fuel and Lighting	Metals and Metal Products	Building Materials	Chemicals and Drugs	House Furnishing Goods
1900	56.1	50.5	49.4	53.3	46.3	98.0	46.2	82.1	48.9
1901	55.3	52.8	48.9	48.1	44.6	93.1	44.3	84.2	48.9
1902	58.9	58.4	50.8	49.4	51.8	91.0	45.3	86.5	49.2
1903	59.6	55.6	49.9	52.8	60.3	90.2	46.7	84.1	50.9
1904	59.7	58.5	49.7	52.9	53.3	79.9	45.0	84.1	50.3
1905	60.1	56.4	53.9	54.1	49.6	89.1	48.1	82.3	49.7
1906	61.8	57.3	57.7	58.7	52.0	102.4	54.0	76.8	51.3
1907	65.2	62.2	58.0	63.5	54.4	109.8	56.8	78.5	55.0
1908	62.9	62.2	55.6	54.8	53.7	86.3	52.0	79.6	51.6
1909	67.6	69.6	61.5	56.5	51.6	84.5	53.7	79.9	51.7
1910	70.4	74.3	60.2	58.4	47.6	85.2	55.3	82.0	54.0
1911	64.9	66.8	58.8	55.5	46.7	80.8	55.3	81.6	52.7
1912	69.1	72.6	64.5	55.7	51.4	89.5	55.9	80.7	53.0
1913	69.8	71.5	68.1	57.3	61.3	90.8	56.7	80.2	56.3
1914	68.1	71.2	70.9	54.6	56.6	80.2	52.7	81.4	56.8
1915	69.5	71.5	75.5	54.1	51.8	86.3	53.5	112.0	56.0
Average	63.7	63.2	58.3	55.0	52.1	89.8	51.3	83.5	52.3

PERIOD, 1916-1925, INC.

1916	85.5	84.4	93.4	70.4	74.3	116.5	67.6	160.7	61.4
1917	117.5	129.0	123.8	98.7	105.4	150.6	88.2	165.0	74.2
1918	131.3	148.0	125.7	137.2	109.2	136.5	98.6	182.3	93.3
1919	138.6	157.6	174.1	135.3	104.3	130.9	115.6	157.0	105.9
1920	154.4	150.7	171.3	164.8	163.7	149.4	150.1	164.7	141.8
1921	97.6	88.4	109.2	94.5	96.8	117.5	97.4	115.0	113.0
1922	96.7	93.8	104.6	100.2	107.3	102.9	97.3	100.3	103.5
1923	100.6	98.6	104.2	111.3	97.3	109.3	108.7	101.1	108.9
1924	98.1	100.0	101.5	106.7	92.0	106.3	102.3	98.9	104.9
1925	103.5	109.8	105.3	108.3	96.5	103.2	101.7	101.0	103.1
Average	112.4	116.0	121.3	112.7	104.7	122.3	102.8	134.7	101.0
1926	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

"BOOM" PERIOD, 1927-1929, INC.

1927	95.4	99.4	107.7	95.6	88.3	96.3	94.7	96.8	97.5
1928	96.7	105.9	121.4	95.5	84.3	97.0	94.1	95.6	95.1
1929	95.3	104.9	109.1	90.4	83.0	100.5	95.4	94.2	94.3
Average	95.8	103.4	112.7	93.8	85.2	97.9	94.7	95.5	95.6

DEPRESSION PERIOD, 1930-1933, INC.

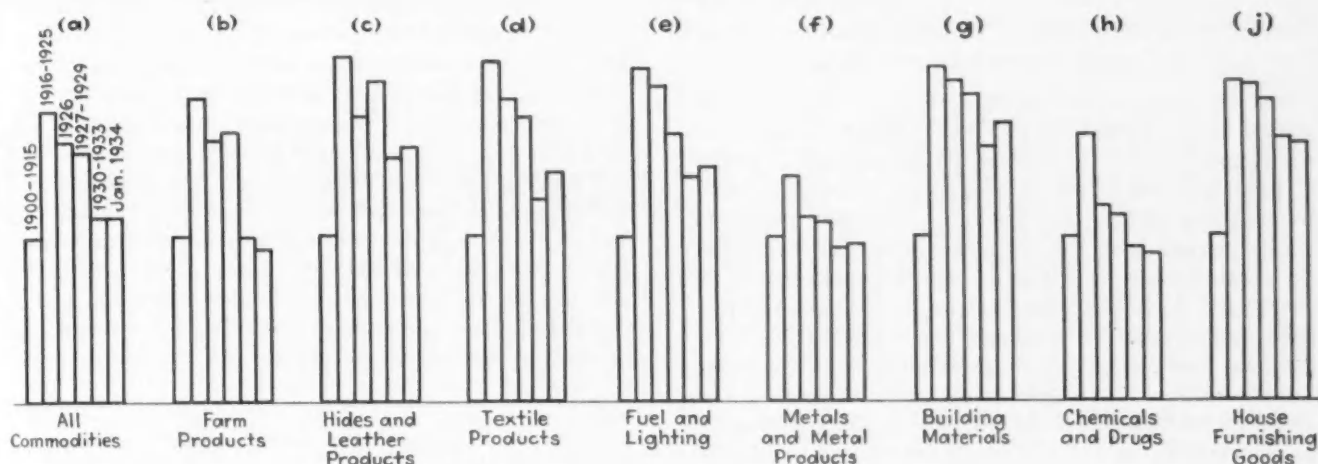
1930	86.4	88.3	100.0	80.3	78.5	92.1	89.9	89.1	92.7
1931	73.0	64.8	86.1	66.3	67.5	84.5	79.2	79.3	84.9
1932	64.8	48.2	72.9	54.9	70.3	80.2	71.4	73.5	75.1
1933	65.9	51.4	80.9	64.5	66.5	79.8	77.0	72.6	75.8
Average	72.5	63.2	85.0	66.5	70.7	84.2	79.4	78.6	82.1

JANUARY

1934	72.2	58.7	89.5	76.5	73.1	85.5	86.3	74.4	80.8
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Wholesale Price Indices, Base, 1900-1915 Inc. = 100

Period	All Com- modities	Farm Products	Hides and Leather Products	Textile Products	Fuel and Lighting	Metals and Metal Products	Building Materials	Chemicals and Drugs	House Furnishing Goods
1900-1915, inc...	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
1916-1925, inc...	176.5	183.5	208.1	204.9	201.0	136.2	200.4	161.3	193.1
1926	157.0	158.2	171.5	181.8	191.9	111.4	194.9	119.8	191.2
1927-1929, inc...	150.4	163.6	193.3	170.5	163.5	109.0	184.6	114.4	182.8
1930-1933, inc...	113.8	100.0	145.8	120.9	135.7	93.8	154.8	94.1	157.0
January, 1934...	113.3	92.9	153.5	139.1	140.3	95.2	168.2	89.1	154.5



Price Modesty Does Not Seem to Always Pay

Here is a 34-year record of price changes by periods for the major groups of industry and agriculture. Note the profiles. No two are alike. Also note that the groups which raised prices the most during 1916-1925 inflation period have advantaged positions under the choice of 1926 as a "normal" price level, whereas the groups which were more modest in their demands upon customers' pocketbooks are disadvantaged.



Compare the first and the second bars in each group. It gives you a good idea of how price levels were boosted during the "inflation" period.



Compare the first and the last bars in each group. This shows you which groups are now above their 1900-1915 averages in price levels and which ones are now below them.



Which group would you say had shown the most consistently conservative price policy over the long term? Isn't it group "f"?

public a very clear idea of their topography. And no more so does the commodity index or the subdivision indices of price levels.

Confined to skilled statistical hands, where they belong, indices of price serve a useful purpose in measuring changing relations. Outside of statistical hands and especially as used for the purpose of attempting a "planned economy," price indices may be as dangerous socially as dynamite in the hands of a small and inquisitively-minded boy.

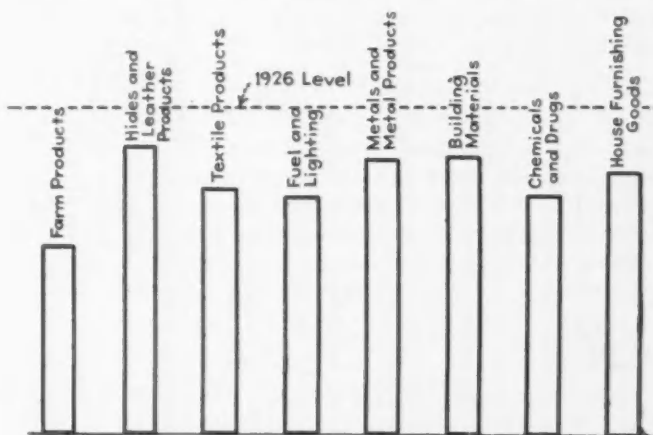
What Is the Commodity Index?

The general commodity index, compiled by the Bureau of Labor Statistics for any given week, month or year, is the composite of some 784 individual common commodities, weighted according to their importance and expressed by a figure representing the arithmetical relation of their average weighted price to the average price of them in some year chosen to represent 100. At present, 1926 is chosen as the year of 100, or par for the course.

The index figure, it must be remembered, is not a price. It is an expression of *price relation*. A current index figure of 200, for example, would indicate that the average actual prices prevailing for the commodities taken into consideration were just twice as high as those prevailing for them in the "base" year of 1926.

Going a step further, we find that the general commodity price index for any given year is broken down

into a number of component groups, each of which also has its index. The principal groups are as follows: Farm prices, food products, hides and leathers,



How Does Your Industry Show Up Under the 1926 Price Base?

"What big prices you have, grandmother," says little Red Ridinghood to the metals and metal products group as she peers through 1926 price glasses. "Aren't you out of line with respect to other industries?"

Certainly this group, and some others, seem in rather exalted relative position. But it's all in the way you look at things.

Price relations are as of January, 1934, with index based on 1926=100.

textiles, fuels and lighting, building materials, drugs and chemicals, house furnishings and metal products.

For the base year chosen the index of each of these groups is 100. And the general commodity index for that year is 100. This does not mean that a pound of steel, a pound of cotton or a pound of leather could be obtained during that year for the same price. It simply means that the average prices that prevailed for steel, leather or cotton during that year would be considered as 100, so that past or future variations of each group could be measured with respect to itself and also to other groups. Two years later the index for steel may be 110, let us say, and for leather 120 and for textiles 130. All of which gives changing price relations between different groups of industries and between different periods of time.

From the statistical standpoint, it makes no difference what year is chosen as a base since price indices are merely a measure of price variation from year to year and any year will serve as a measuring stick. From the standpoint of *economic planning*, the choice of the base or "par" year makes a tremendous difference. And what is said in this article must be taken, not as a criticism of statistical practice, but as an indictment of the erroneous assumption that a statistical premise can be bodily transplanted into an economic precept.

No One Year Is a Proper Base

From the standpoint of economic planning of price levels, the choice of 1926 or of any other single year is a serious mistake. It would be as sensible to attempt to characterize the career of notables by choosing what was accomplished in some single year of each one's life. Under such a system Shakespeare might go down in history as a poacher and Lincoln as a rail splitter. Certainly that would not be doing justice to either of them.

If we were to attempt to characterize the career of individuals by cross-sections, surely we should take an average of some normal years of maturity for this purpose. And the same principle holds true if we are to attempt to adjust price levels between groups of industries for the purpose of economic planning. We should choose, not a single abnormal year, but a term of normal years in order to establish our relationships.

For this reason I have selected for the purpose of this study as the base for comparisons, not 1926, which was an abnormal year, but the 16-year pre-war period from 1900 to 1915, inclusive. This is the latest long-term pre-war period for which we have reliable price data. Certainly the inflation period from 1916 to 1925 cannot be taken as normal nor can the so-called boom period of from 1927 to 1930. Nor can we choose the depression years of 1931 to 1933.

With this introduction, I will let the accompanying statistical pictures tell the story.

Refuting the Federal Trade Commission

That considerable misinformation exists in public quarters with respect to price relationship is indicated by the report of the Federal Trade Commission made last week to the Senate Committee on the subject of

the steel code and steel prices. On pages 56 and 57 of this report, (mimeographed form), the Federal Trade Commission criticized an editorial which appeared in *THE IRON AGE* of Feb. 22, entitled "Let's Examine the Price Record." This editorial showed that on the basis of Department of Labor statistics, the price level of the metals and metal products group as of the week of Feb. 3, 1934, was 5.2 per cent under its average level for the long-term period from 1900 to 1915 inclusive, and that farm prices, as reported by the same source and for the same week of Feb. 3, were but 4.3 per cent under their long-term price average for the same 1900 to 1915 inclusive period.

Says the Federal Trade Commission's report:

The figures for steel prices cited in the statement quoted are averages of basing point prices, which, as has just been shown, are in few cases actual prices, being merely the starting point of a calculation by a formula. The net realized prices received by sellers under the basing-point practice are not reported to any statistical agency, public or private, but they are known to be, in great numbers of cases, more than actual base prices by large amounts, and are so as the necessary result of the formula. Under a system of f.o.b. mill prices, on the contrary, the statistics could and would reflect actual prices and actual averages at each producing center. For these reasons it is plain that the quoted comparison between farm prices and metal prices is meaningless and invalid.

As a matter of fact, steel prices were not given in the editorial in question, the comparison being between farm prices as a group and metals and metal products, of which iron and steel prices are a component or subgroup. Waiving this misstatement, however, and confining ourselves to the argument concerning the supposed error in using basing point prices instead of realized prices in such a study, I may say that in a study of price relationships, it makes no difference whatever which are used, so long as you stick to one kind. For we are talking about *price relationships*, not prices. It makes no difference whether you use a rule divided into centimeters, inches or "versts" in measuring the height of a boy at two or more different ages to find out his percentage growth, so long as you use the same unit or rule each time that you measure. Basing point measurement of steel prices has existed over the entire period under discussion. Moreover, a study of spreads between basing point prices and realized prices over the term of years would reveal such synchronization as to make no perceptible differences in the results of period comparisons.

Iron and Steel Prices Consistently Below Metal and Metal Product Group

There are no complete statistics of realized prices for steel, but there are quite complete figures for farm prices received by farmers, recorded since 1910 by the Bureau of Farm Economics. These of course are "realized" prices. A comparison of the fluctuations of the indices from this source with those of the indices of the Department of Labor for wholesale prices of farm products, which are basing point prices, is given in an accompanying chart. The synchronization is striking.

Another objection registered by the Federal Trade Commission to *THE IRON AGE* editorial is as follows:

(Concluded on Page 66)

Axle Fatigue Inhibited by Truss-Graining

By F. F. JOHNSON

Research Engineer, Spencer Mfg. Co., and
T. W. LIPPERT, The Iron Age

AS the mileage of hard surface roads has greatly increased during recent years, it has been generally assumed that automobile axle shaft failures would be less frequent. In addition, advanced engineering designs and improved steels,

smoother clutch action, and higher standards of chassis construction, all would naturally encourage the supposition that axles would perform more satisfactorily and be more dependable.

Despite these considerations, there

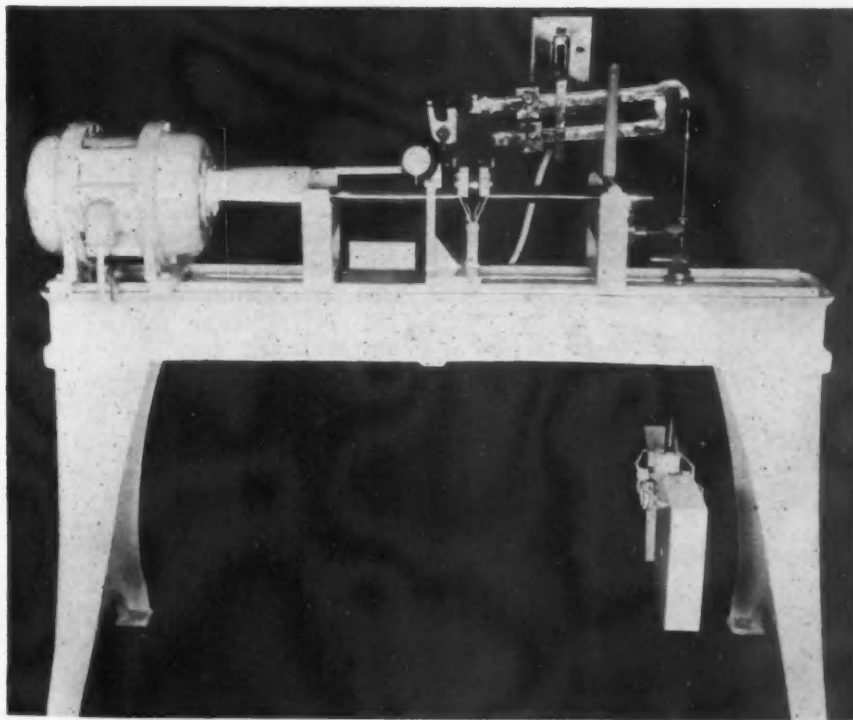
AUTOMOBILE and railroad axles usually fail in service as a result of a propagation of fatigue cracks through the material. This weakness is evidenced by all materials, regardless of the chemical compositions, heat treatments, or finishing processes employed. The Spencer Mfg. Co., Spencer, Ohio, has succeeded in greatly reducing the fatigue of standard steels by altering the structures in a purely mechanical manner. Laboratory tests simulating actual road conditions have shown surprising increases—often as high as 100 per cent—in axle life as a result of a truss-graining treatment. In all cases, the steels considered are quenched and drawn according to standard practices, but preceding the final quench, an extra mechanical operation results in greatly reducing incipient surface faults and internal submicroscopic flaws. Although a metallographical analysis of the structure changes is not yet available, the accompanying article describes the laboratory results obtained, and deals to some extent with the process employed to secure more efficient axles.

have been a consistent number of axle failures during late years despite the manifold claims made by various advocates of alloy steels. At the Spencer Mfg. Co. an investigation was undertaken in order to determine the causes and possible prevention of failures.

A careful record of failures through a number of years disclosed the fact that more than 90 per cent of breaks resulted from fatigue. As physical standards, such as tensile, torsional and bending strengths, and design factors have been fairly well established, these qualities seemingly had little influence on the resistance to fatigue.

This generalization is well borne out by the summary of R. Künel, Commissioner of German Railroads, in his report in *Glaser's Annalen*. Dr. Künel concluded from many years' study of railroad axles, that defective material is least often to blame for failure. Some of the axles were made 50 years ago, and when they recently broke, the chemical compositions were found to have a wide variation. The analyses showed C, 0.13 to 0.40; Mn, 0.20 to 1.15; Si, trace to 0.20; P, 0.09 to 0.15; S, 0.04 to 0.08 per cent.

Dr. Künel divided the failures into
(Continued on Page 72)



Spectators at the recent New York National Automobile Show witnessed the breaking down of various steel axles on this Spencer fatigue testing machine. The test axles were driven at an average speed of 1180 r.p.m. by means of a flexible coupling and a standard 2-hp. motor. The test axle was grooved at the center, and carried a mean weight of 715 lb. at the mid-point through a beam and fulcrum arrangement. The bar and center weight carriages are cradled in ball bearings. When the bar breaks, the falling scale beam actuates a motor cut-out, and also locks a counter indicating the total number of revolutions.

Controlled Atmospheres for Electric

EARLY applications of controlled atmosphere furnaces were made shortly after the turn of the century, during the period when pure and ductile tungsten was being developed. Originally tungstic oxide powder was reduced in the vacuum type electric furnace, but the metal was contaminated by carbon used to assist in the reduction. By doing this work in another type of controlled atmosphere electric furnace, having a hydrogen atmosphere, the chemical action could be exactly controlled, and contamination from the reducing material was entirely avoided. It was found that bars of tungsten having excellent physical properties could be made by pressing this pure powder and solidifying it in a small hydrogen electric furnace.

Another of the very early applications for the controlled atmosphere

furnace was for electric furnace brazing.

Early Discovery of Electric Furnace Brazing

The process was first "discovered" in the General Electric Research Laboratory during the reduction of tungstic oxide contained in a copper boat in an iron tube. Hydrogen was passed through the tube for the reduction. The temperature got beyond control at one point in an experiment and the copper boat melted. Upon examination it was found that the copper had wetted the surfaces of the reduced tungsten and the iron tube, and had formed a strong, firm bond between the two metals. Another similar accident showed copper to flow long distances on iron wires used as a supporting grid for some tungsten filaments being treated in hydrogen.

The first commercial use of these findings was made in the copper brazing of tungsten tips on gas-engine ignition coil contacts.

Because such work came from the furnaces clean and bright, small objects were also bright annealed in protective atmospheres—sometimes in hydrogen, sometimes in nitrogen, and often in mixtures of the two. Metals were also heated for hot working, in the non-oxidizing gases. In these ways the use of controlled atmospheres in small electric furnaces got its early start.

Later in the manufacture of large turbine generators, it was found desirable to electric-furnace braze bucket rings and other parts which called for pioneering in the design and use of large production type furnaces with controlled atmospheres. A 400-kw. furnace was built shortly after the war, in 1920, and proved to be, to the astonishment of some, a tremendous success. This led to the installation of many more equipments for the same class of work.

It was found in the laboratory that hydrogen imparted favorable properties to certain grades of magnetic iron for electrical machinery, and in 1924 several large 130-kw. to 240-kw. controlled atmosphere elevator-type furnaces were installed for the annealing of silicon steel sheets,

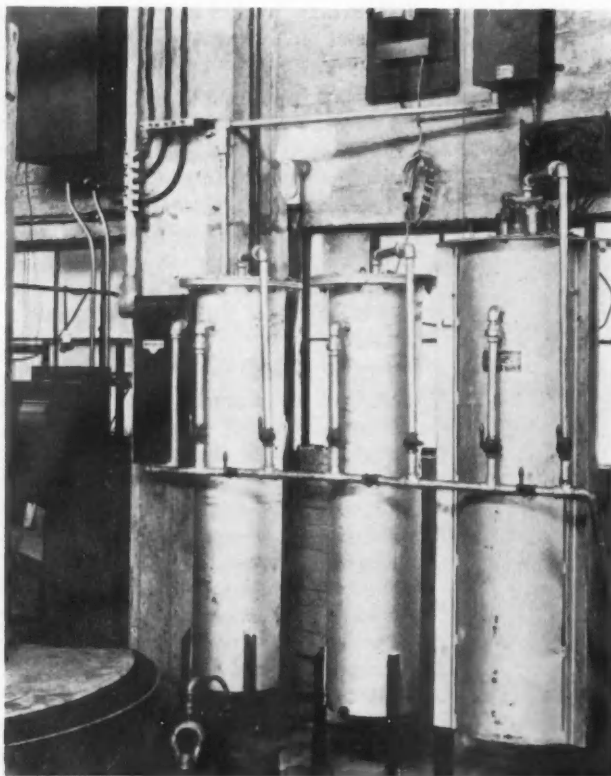


Fig. 1—For purifying city gas an outfit is used that includes a heated tower containing cast iron chips and two towers containing calcium chloride for removing moisture.



Furnaces

By H. M. WEBBER

Industrial Dept., General Electric Co.

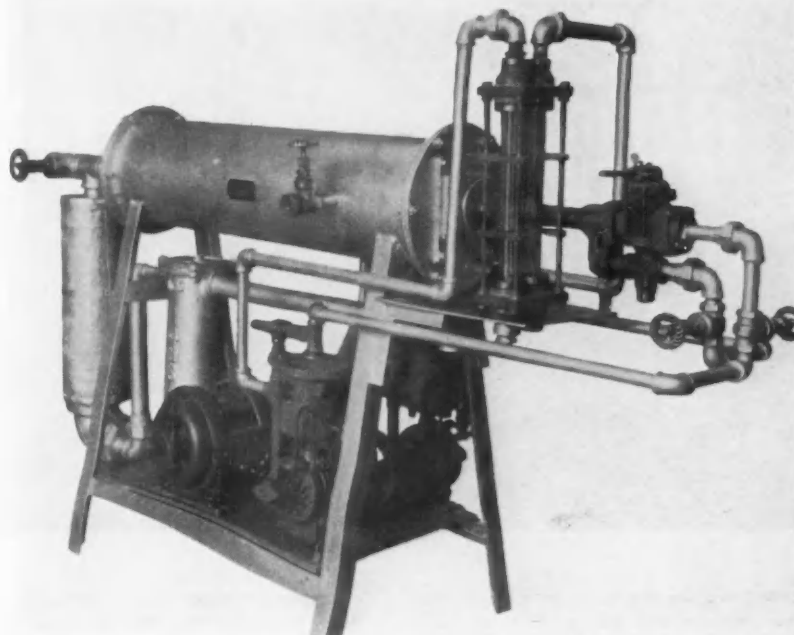


Fig. 2—For processing city gas or natural gas to render the gas suitable for the electric furnace, the General Electric Co. has developed a furnace atmosphere controller, of the combustion type, of 500 cu. ft. per hr. output.

punchings, and strip, in large scale production. These installations were followed later by others.

Then came the development of the electric refrigerator which required the copper brazing of millions of machine parts. This called for the development of huge furnaces of the continuous type with controlled atmospheres for electric furnace brazing, one of which was built in 1926, rated 300 kw. And the dry bright annealing of spooled copper wire in the bell-type electric furnace was still another early controlled atmosphere application used in electrical manufacturing.

Now there is a general acceptance by industry as a whole for processes and furnaces of this type and there is a tendency to employ controlled atmospheres wherever possible. Bell-type furnaces are used for annealing steel sheets and strip, non-ferrous strip, wire and tubing, etc. Continuous furnaces anneal steel strip and punchings and non-ferrous tubing, punchings, stampings, etc. Batch and continuous furnaces are employed for electric furnace brazing in both small and large volumes.

Use of Purified City Gas

To make such applications economical, auxiliary equipments have been built to supply inexpensive gases for use as atmospheres—devices which can be set up beside the furnace at low cost and will operate with very little attention. For instance, in the bright annealing of steel strip in the

bell-type electric furnace, purified city gas, which is ordinarily high in hydrogen content, serves to protect the surfaces of the steel adequately, and the only auxiliary needed is the purifier shown in Fig. 1.

The complete outfit consists of a heated tower containing cast iron chips for removing oxygen and sulphur and two chemical towers containing calcium chloride for removing moisture. The hot tower is heated to about 1100 deg. F. with four hair-pin sheath wire units, each rated 2.5 kw., and is provided with automatic temperature control. Since the annealing furnace temperature is generally low, 1100 to 1300 deg. F., only a small amount of carbon from the gas is deposited on the charge of coiled strip, and since the gas atmosphere is maintained only within the retorts, the furnace walls and resistors are amply protected from such deposit. The clean, bright polish on low-carbon strip is preserved in the purified city

gas atmosphere, and high-carbon strip is annealed without a trace of surface decarburization.

Another mixture of gases suitable for many controlled atmosphere applications, and one which is inexpensive, can be produced by the partial combustion of city gas, natural gas, or butane in the equipment shown in Fig. 2. The product gas usually costs less than 30c. per 1000 cu. ft., so it can be used freely as a furnace atmosphere with little effect on the overall heat treating cost. The atmosphere is in effect the same as that used for years in fuel-fired furnaces, except the product gas is purified of oxygen, sulphur, and water vapor before it enters the furnace chamber. The combustion takes place in a separate chamber under precise control.

Using Gas of Controlled Combustion

Unlike the other gas producers discussed here, the combustion-type furnace atmosphere controller can be ad-

Typical Analyses of Industrial Gases and Processed Gases Used for Controlled Atmospheres

Constituents	City Gas	Natural Gas	Processed Gas from Combustion-type atmosphere Controller (Adjustable)	Disassociated Ammonia	Electrolyne
Carbon dioxide (CO ₂)	1.9	0.8	6.0	....	1.5
Oxygen (O ₂)	..8	....	....	....	....
Illuminants (C ₂ H ₄)	2.8	....	....	....	....
Carbon monoxide (CO)	7.4	....	6.0	....	19.5
Hydrogen (H ₂)	55.5	....	6.0	75.0	74.0
Methane (CH ₄)	28.2	96.0	....	....	1.0
Nitrogen (N ₂)	3.4	3.2	82.0	25.0	4.0
	100.0	100.0	100.0	100.0	100.0

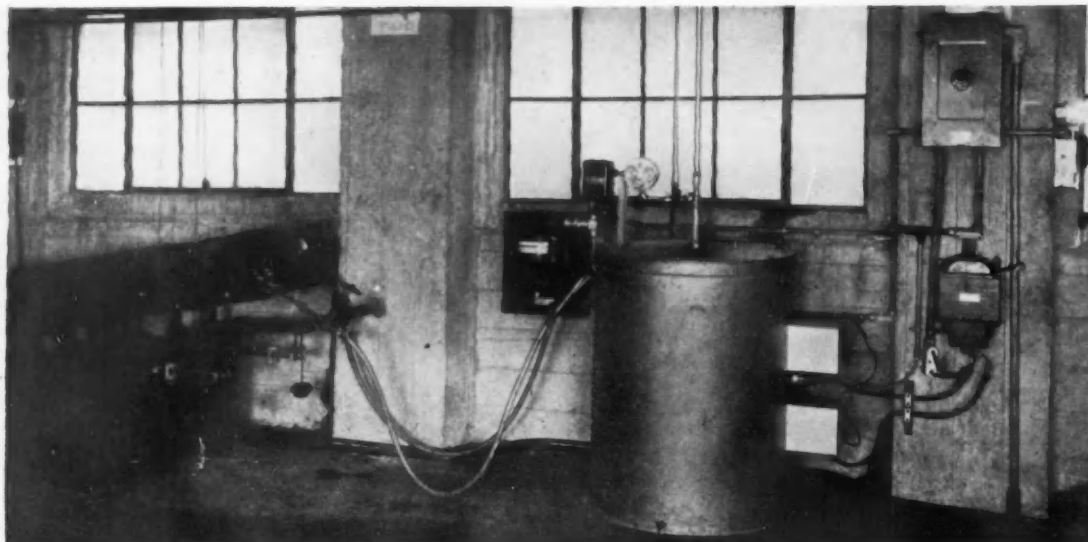


Fig. 3—For annealing coiled steel strips at the Thomson Wire Co., Mattetan, Mass., a 10-kw. 300 cu. ft. per hr. ammonia dissociator supplies protective gas atmosphere to bell-type furnaces.

justed within limits to give an output gas having an analysis most suitable for the application at hand. The major constituent of the mixture is nitrogen, but it also includes hydrogen, carbon monoxide, and carbon dioxide. By using fairly complete combustion, the hydrogen and carbon monoxide content can be burned down low enough to render the product gas non-inflammable and almost inert. Such a gas is suitable for some bright annealing applications and eliminates the explosion hazard.

However, by burning with a richer mixture, the output gas can be made slightly inflammable, having reducing properties required for certain bright annealing jobs; and by going still further, a gas containing a total of about 30 per cent reducing components (hydrogen and carbon monoxide), and one which is very suitable for electric

furnace brazing, can be obtained. The low cost of the gas is due to the addition of a large amount of nitrogen from the air used in combustion. With city gas there is a volume increase of about 3 to 1, with natural gas 6 to 1, and with butane 15 to 1. Thus the product gas costs about one-third, one-sixth, or one-fifteenth, respectively, of the price of the raw material.

The equipment consists of a burner, a combustion chamber lined with refractory, two motor-operated compressors for maintaining constant input pressures of air and gas, two visual flow meters for checking input ratio, a purifying chamber for removing oxygen and sulphur from the product gas, and a surface cooler and trap for condensing the water vapor formed in the combustion.

In Fig. 3 is shown an ammonia dis-

sociator used as a source of gas for steel strip annealing in a bell-type furnace. The gas coming from this unit is made up of 75 per cent hydrogen and 25 per cent nitrogen, and is obtained by cracking, at about 1500 deg. F., anhydrous ammonia supplied from the cylinders shown mounted on the scales at the left. About 45 cu. ft. of the mixed gas is obtained from one pound of ammonia, the total cost of the gas being about \$4 per 1000 cu. ft., where average priced materials are available. Due to its high content of pure, dry hydrogen, dissociated ammonia is quite suitable for most bright annealing and electric furnace brazing applications and is finding rather general use. The dissociated equipment is built of standard electric furnace construction with side-wall ribbon resistors and a coiled alloy tube dissociating element, filled

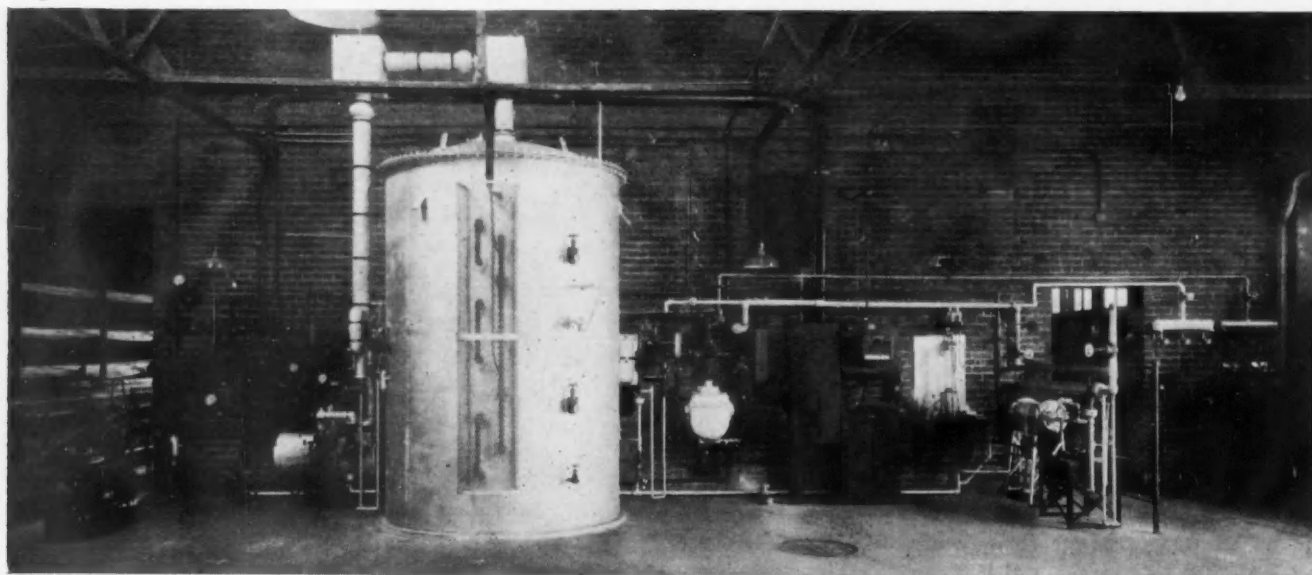


Fig. 4—A General Electric Electrolene producer, supplying 1000 cu. ft. per hr., and taking 65 kw. of three-phase current at 220 volts, is in use by the Bundy Tubing Co., Detroit.

with steel balls which act as a catalyst.

The Electrolene Producer

Still another form of gas-producing equipment is the electrolene producer shown in Fig. 4. The gas from this unit is a mixture with high reducing properties, consisting mostly of hydrogen and carbon monoxide. Its cost is in the neighborhood of 80c. per 1000 cu. ft., depending upon cost of materials available. Either city gas or natural gas can be used as a raw material, to be mixed with a constant proportion of water vapor and fed into the producer retort chamber, operating at about 2000 deg. F. A 2-to-1

volume increase results with the use of city gas, and a 4-to-1 increase with natural gas. Electrolene has been used most generally for electric furnace brazing because of its reducing properties and its low cost. It is, however, suitable for other applications.

The electrolene producer is a vertical cylindrical electric furnace equipped with side-wall ribbon resistors, and an alloy retort consisting of a header and several vertical tubes. Water vapor is supplied to the unit by bubbling the ingoing gas through an electrically heated water bath. The gas is thus saturated at a controlled temperature, assuring constant input of moisture for the reactions within

the producer. The installation like the others described above, is simple to operate and requires no attendant because of the automatic features provided.

To supply controlled atmospheres for very small electric furnaces, hydrogen and nitrogen are sometimes purchased in cylinders under pressure, the capacity of an average tank being about 200 cu. ft. The cost of such gases is in the neighborhood of \$15 per 1000 cu. ft. When appreciable quantities of gas are used, however, it is generally economical to install a gas producer, because such a device will pay for itself in a very short time.

Anneals Wire in Hydrogen Gas

THE accompanying photograph shows a development by the Newark Wire Cloth Co., Newark, N. J. A battery of hydrogen wire annealing furnaces may be seen in the background. Behind the furnaces, somewhat hidden from view, are racks of spools containing the fine wire as taken from the wire drawing machines and requiring annealing. These wires are run automatically from the spools, through a continuous, horizontal metal tube filled with hydrogen gas under pressure. This hydrogen atmosphere serves to prevent oxidation and thus help give the annealed wire a

clean, smooth, bright surface, free of spots and discoloration.

Part of the hydrogen filled tube is mounted in an electrically heated compartment under thermostatic control. The remainder of the tube is the cooling chamber. The wire thus travels, in turn, through the heating zone and adjacent annealing chamber, and then upon the spools, shown in the foreground, at a pre-determined rate of speed and all in one continuous operation. The bright, smooth and clean character of the annealed wire on the spools is evident in this photograph, which has not

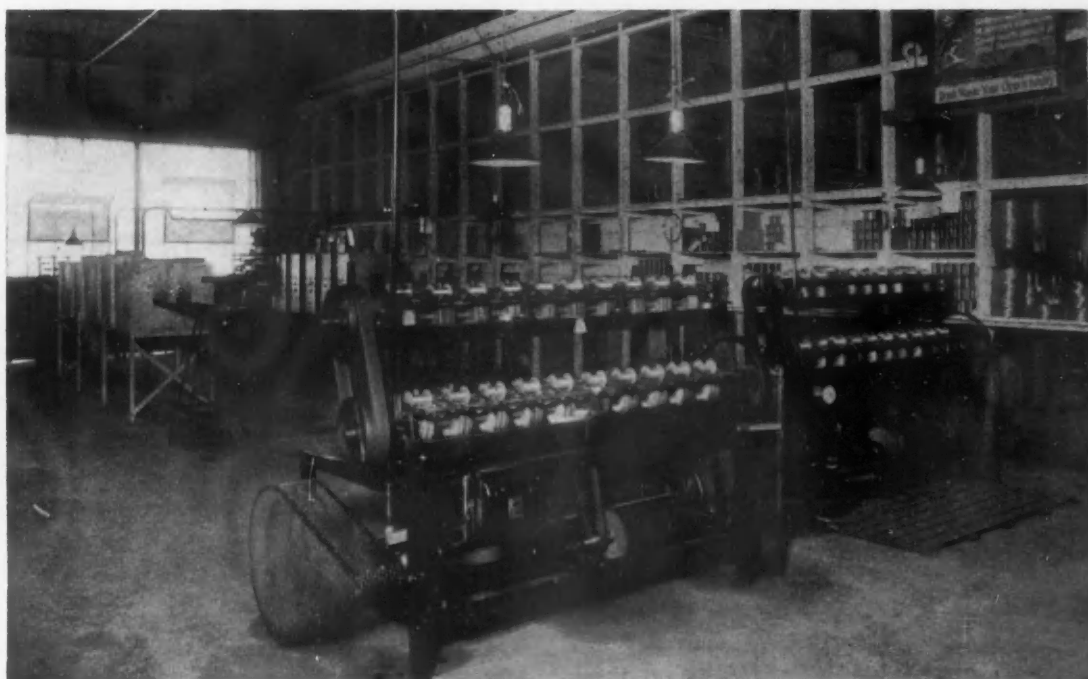
been retouched or otherwise altered.

As a result of the arrangement the annealed wire is wound directly upon the spools, which go to the wire cloth looms, thereby eliminating the usual practice of first winding from coils. Besides securing a uniform annealed and a clean and bright surface, kinks and abrasion nicks often caused by extra handling are avoided. The Newark Wire Cloth Co. manufactures wire cloth for industrial services, such as cloth made of copper, stainless steel, Monel metal, nickel, molybdenum, aluminum, platinum, silver, phosphor bronze, Nichrome, etc.

▲ ▲ ▲

The bright annealed wire being wound on spools in the foreground is coming from spools in the background being passed through an annealing chamber in the middle ground employing hydrogen gas under pressure and thermostatically controlled.

▼ ▼ ▼



How Attractive Finish Helps Metal

TWO men were talking, one a manufacturer of building hardware, the other an industrial engineer. After listening to the manufacturer's account of high production costs and general business difficulties the engineer said, "I think I can locate your trouble. It is in your polishing department." Later when asked why he had hit upon that particular spot without having even seen the plant, the engineer admitted it was because polishing was the "best bet." In other words, a man looking for an opportunity to lower manufacturing costs would have more chance of success in the polishing room of a metal working plant than in most any other department.

In any finishing operation a factor other than production cost enters, for here a poor job may mean reduced sales appeal and thus the penalty for inefficiency is multiplied.

One of the most important features in the whole polishing process is the conditioning of the wheels. As already pointed out, a typical polishing wheel consists of a resilient base onto which a "head" or abrasive coating is ap-

BY carefully sizing the abrasive grain used, one manufacturer was able to increase his polishing efficiency by more than 25 per cent. Many similarly slight details are important factors in polishing and buffing. This article describes some features covering the care and selection of polishing wheels and abrasives, and outlines the present trend toward the use of automatic polishing machinery.

plied. The coating wears down rapidly in use and therefore the wheels constantly must be reconditioned.

Wheels Are Polisher's Tools

Different manufacturers have different methods, but almost always added attention to the conditioning of the wheels means increased production and lower overall cost. In the polishing department the wheels are actually the tools of the polishers and

the wheel room is in a sense their tool room. This means that the care of wheels should at least equal the standards set in a good tool department.

Undoubtedly one of the big handicaps in the whole realm of polishing is the fact that even experienced operators are inclined to overlook the importance of proper selection and care of wheels and abrasives. New wheels usually are given special care to get them started right, and where there are several men in the conditioning room the most experienced one is given the job of starting off a new wheel on its life of service.

One manufacturer has the practice of truing its new wheels on a lathe and marking them with an arrow to indicate the direction of rotation. Each wheel as it is removed from the lathe is coated with a thin sizing of glue brushed on in the direction of the nap of the wheel. Glue is also applied to the sides of the wheel to prevent grease and oil from penetrating during subsequent polishing and handling. A base for the abrasive is then prepared with a heavier coat of glue, and the abrasive grains are rolled into this base by the usual hand method.

Applying the Abrasive

This particular rolling operation calls for a great deal of skill and experience on the part of the operator. Small metal troughs are used to hold the abrasive grains, one trough for each size. These troughs are slightly wider than the width of the widest wheel to be coated, and the bottom of the trough forms the arc of a circle of considerably larger radius than that of any of the wheels.

Each freshly glued wheel rests on a short shaft through its bore. The operator takes hold of both sides of this so that the wheel itself is free to revolve between his arms. He then rolls the wheel back and forth in the trough until the entire surface has been coated with the abrasive. In this operation all of the many variables must be correct in order to give the most satisfactory job. That is, the temperatures of the wheel, the glue, and the abrasive must be held within close limits, and the time interval



Material handling is an important consideration in nearly all polishing. Here operators of double disk polishing machines are served by roller conveyors.

between the gluing operation and the rolling in of the abrasive must be regulated. It is almost as bad to roll abrasive into too fresh a surface of glue as it is to try to apply the abrasive after the glue has set.

When used wheels are to be coated, the practice is somewhat different. If the surface is deeply pitted or covered with excessive grease or oil, the head is usually soaked off in hot water. If the wheel has been worn through the under or sizing coat, it should be resized with a mixture of thin glue and fine abrasive.

Cleaning Old Wheels

In any case the wheel is usually trued up with a carborundum or similar brick which is rubbed across the face and edges while it is revolving. It is sometimes advisable to remove oil and dirt on the face of a wheel by scrubbing with gasoline and then thoroughly drying. After the wheel has been prepared, the practice of coating with abrasive is similar to that in the case of a new wheel except that often fewer coats of abrasive are required on an old wheel.

One manufacturer recommends a temperature of 120 deg. F. for the abrasive applied to old wheels, and a temperature of 110 deg. F. with new wheels. This is because practice has shown that the heat conductivity is greater in the case of the old wheel.

Operators usually have a flat steel table close to the abrasive troughs in which the wheels are rolled and, after coating, the wheel is then rolled on the table to determine whether the coating has been sufficient. If glue comes to the surface as the wheel is rolled on the table, it is an indication that further rolling in the abrasive is required. Machines are now available for coating wheels with the abrasive under conditions giving an accurate predetermined pressure and time.

Coating Practice

Most manufacturers seem reluctant to change to machines in this particular field, and hand coating of polishing wheels with glue and abrasive is still the prevailing practice. In some large shops the equipment in the glue and coating room is elaborate. The room

By HERBERT R. SIMONDS

itself is glass enclosed, is dust proof, has its own humidity and heating system and is conveniently arranged. The equipment may include recording thermometers, humidity instruments, glue density indicators, scales, sieve grading machines and elaborate conveyor devices in addition to the more standard items such as steel table,



The microscope readily reveals the fineness of the abrasive used in polishing. The surface of upper plate was produced with No. 36 grain, and the surface of the plate below with No. 120. Both microphotos were taken with the same magnification by Norton Co.

drying ovens, electrically heated abrasive pans and glue pots.

One manufacturer gives the following instructions for putting the final coat on to wheels: "The wheels should be heated to 120 deg. F. in a warming closet to prevent glue chilling. A brush of a width proportional to the wheel thickness should be used to apply a large quantity of glue from a nearby glue pot. It is important to cover evenly the same amount of area of the wheel with each brushful of glue, as it is this point which determines the uniformity of the head when finally coated. The operation should be done rapidly to prevent jellying of the glue. After the final coat of abrasive has been rolled on to the wheel and the wheel itself has been cured, it is important to give the wheel a true balance by the use of lead washers or some similar device. Balance is important to prevent pounding in operation and resultant non-uniform finish."

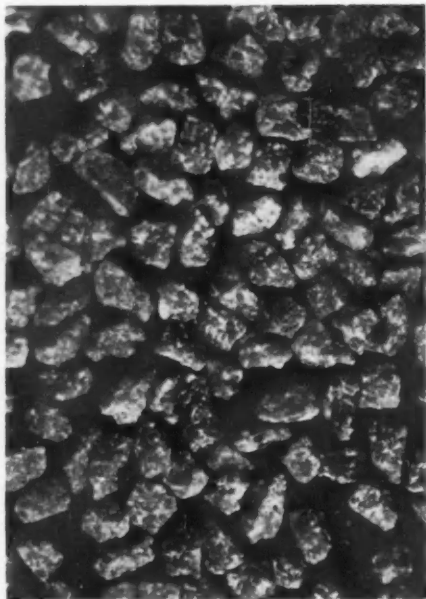
Suit Wheel to Job

In polishing as in grinding there is one particular type of wheel and abrasive for each job. Opinions may differ as to some of the characteristics and with different types of wheels different abrasive characteristics are sometimes called for. In the final analysis it must be the experience of each individual shop which determines the selection. The head of the polishing department should understand, however, that varying wheel conditions give varying results and he should not assume that any one wheel is best until he has tried others.

Some of the variables to be considered in polishing are speed of wheel, pressure of wheel against work, character of the base metal, character of the wheel, that is, whether of canvas, leather, or other material, rate of feed of material, size and shape of grain, type of glue, and nature of lubricant.

Abrasive Characteristics

Artificial abrasives are usually selected for the preliminary polishing operations. The so-called roughing or dry finishing operations include the



This shows carefully selected No. 36 alundum abrasive grains. Note the jagged surface of each grain and the uniform size.

use of grades up to about No. 120. For this class of service one advantage of artificial abrasive grains over Turkish emery, for instance, is that the artificial abrasive fractures when dull and thus constantly presents new sharp cutting edges. The edges of Turkish emery on the other hand are apt to wear smooth without fracturing. However, the very property of wearing smooth makes certain natural abrasives desirable for the so-called coloring operations which may be broadly designated as those using a grain size finer than No. 150.

Many details in connection with abrasive characteristics seem trivial to some manufacturers, yet on recent tests it was shown that accurately sized grain gave a 25 per cent higher efficiency than an abrasive grain with wider variation between particular diameters. The importance of the shape of the grain has already been mentioned. The shape affects adhesion to the glue, the character of cutting, and also the action in the rolling trough. Grains of proper packing quality in the trough give more rapid adhesion to the face and prevent the necessity of pounding the wheel in the trough.

Care of Wheels Pays

The proper preparation of a polishing wheel is expensive and for this reason many smaller manufacturers are inclined to slight some of the precautions. One plant which has kept costs over a long period of time has found that the total refinishing of a wheel 24 in. in diameter with a 4 in. face averages about \$0.32. This includes glue, abrasive, labor and inci-

dental direct cost in the wheel room. On heavy polishing work such a wheel has a useful life of about 1 hr. This same manufacturer cautions against drying wheels too quickly, and states that in his experience a slow well-regulated heat sequence for drying prevents the glue from becoming brittle and materially adds to the wheel life.

Polishing Soft Metals

A different technique is required for polishing soft metals and because of the great variety of surfaces desired and metals encountered, no set standards have been established. The experience of one manufacturer of aluminum castings may be of interest. He uses 12 in. canvas wheels 2 in. in diameter operating at 4400 r.p.m. and after polishing with a series of wheels up to a fineness of No. 220 he buffs with tripoli cake to remove the polishing marks and then colors with a slaked lime composition cake. For finishing irregular surfaces of castings which do not require such a high gloss, this manufacturer uses flexible paper disks coated with abrasive. These disks are operated with a very slight amount of oil as a lubricant. An excess of oil is apt to stain aluminum and this must be guarded against. Another manufacturer of soft metal products polishes with No. 80 alumina grit used dry and follows this with the sequence of No. 120, No. 150 and No. 180 grits, with a slight amount of paraffin wax as a lubricant.

Machine Polishing

If the quantity is sufficient nearly any product which is to be polished or buffed can be handled through this operation on an automatic machine.

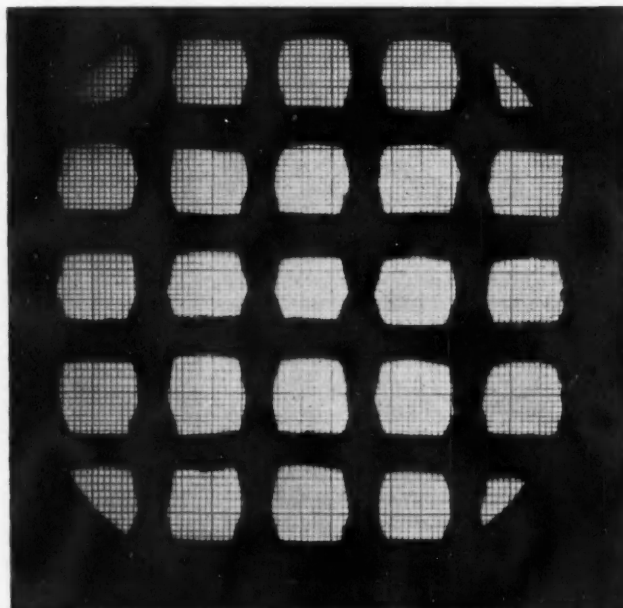
Robert T. Kent, director of engineering, Divine Brothers Co., Utica, N. Y., has devoted much time to the subject of machine polishing during the past five years or more, and he states that automatic or semi-automatic machines can be adopted to reduce the cost of more than 50 per cent of the polishing in the metal industry. Such diversified items as thimbles, lamp reflectors, bicycle rims, wrenches, automobile springs, fender guards and axes are included.

In the case of one product, Stillson wrenches, difficulty was encountered in that the capacity of the machine exceeded the ability of one operator to load. This was overcome by providing an extension end table with a conveyor belt composed of individual jigs which were loaded by two men and were unloaded automatically as the conveyor passed over the tail pulley.

An interesting straight line polishing machine is used to automatically polish the inner surface of bicycle rims. A standard machine was fitted with a track and the rims to be polished were mounted in fixtures which held them in the proper relation to the polishing wheel at the same time that they rested on the track. The movement of the conveyor belt and its track caused the rim to rotate in the fixture while in contact with the polishing wheel and thus completed the polishing around the entire circumference. Formed face wheels were used and two operations were necessary, but, except for the loading, the process was automatic.

Side frames of typewriters are automatically polished on straight line machines with hard compressed leather wheels. Here the proper design of the fixture was the essential feature. It

Fine silk screens are used for grading abrasives. This shows a silk screen with a device over it, used for checking the number of openings per sq. in.



was necessary to hold the piece rigid against the action of the hard wheel and at the same time to obtain precision in location so that the surface would be flat and true. In the case of automobile valve caps the quantity has been sufficient to warrant considerable special attention, and highly efficient hopper feeding fully automatic machines have been designed for this service.

Use of Machines Expands

Automatic polishing is not new. A machine for polishing tea kettles automatically was developed 20 years ago, and the principle involved is still being used for this class of product. Recently, however, and particularly within the past year, a new movement to extend machine operations in the polishing and buffing fields has appeared, and large manufacturers of products such as adding machines, typewriters and radios are installing long straight-line machines on which parts travel successively past polishing wheels of different grades and characteristics, until at the end they leave the machines with the desired finish.

This calls for ingenious jigs and automatic clamping and releasing devices. One adding machine company has a straight-line automatic machine in which parts travel past five pairs of wheels. This machine alone replaces 31 hand jobs and reduces the cost of polishing of certain parts from \$1.12 per 100 pieces to \$0.06 per 100 pieces.

As automatic machines become more standardized, the errors of the earlier machines are gradually being eliminated. It is important, for instance, to have the contact between the work and the wheel of such a nature that it distributes the wear on the wheel. If a short bar with sides parallel to the direction of the travel, passes under a wheel which is revolving in a plane also parallel to the travel, the wear on the wheel will be all in one place and the wheel life will be correspondingly low. By turning the bar at an angle with the line of travel, it is possible to distribute the wear over the full surface of the wheel.

Belts

Maximum distribution of wear over the face of the abrasive surface is secured by having the line of travel of the work at right angles to the direction of the face of the abrasive wheel or belt, and this feature has led some designers to turn to a greater use of belts. This calls for great care in the application of the glue and abrasive to the belt, and



Abrasive grains are sorted through screen trays in a vibrating sieve which forms part of the careful polishers equipment. Courtesy Norton Co.

some of the difficulties will be discussed later under the heading of glue.

In the steel industry, belts are extensively used for polishing sheets, as already explained. Two methods for coating these belts with glue and abrasive are used. Where fine grain sizes are required, the general practice is to thin the glue to the proper consistency for the particular size of abrasive used, and then add the abrasive to form a paste which is spread evenly over the belt. In this method it is important to provide means of continuously stirring the mixture of glue and abrasive to prevent the separation of the aluminous abrasive which has a relatively high specific gravity.

Two or more coats are usually applied to the belt. This method of mixing the abrasive and glue is known as the paste head process and is obviously impractical with coarse grit sizes. Another method of coating belts is to apply the glue to the belt in sections and then apply the abrasive on to the glue by sifting. In this case the grains bond readily with the glue if the surface of the individual grains is irregular or jagged so as to provide surface tenacity. Some large

users of abrasive belts have developed mechanical means for applying the abrasive coating. In one machine for this purpose the belt to be coated revolves slowly through the coating zone. An electrical heating device heats the belt just before the glue is applied. The glue itself is heated and is spread evenly on to the belt by means of a roller. The abrasive particles which are held in a heated reservoir are applied by mechanically sifting on to the fresh glue surface and the operation is completed by means of rollers which even out the surface of the abrasive and glue. On particular work large belts frequently require several days to cure, after which they are trued with silicon carbide brick.

Designing Parts for Polishing

Just as buffing compounds are adjusted to facilitate cleaning, so are the design and machining features of metal products altered to facilitate buffing. A case in point is the familiar electric flatiron. Here, because of a double curve, that is, an oval outline to the base and a varying curve to the cover plate, it was impossible to adapt this to automatic operation.

(Concluded on Page 74)

ECONOMY, speed in operation, and ability to clean strip steel in a wide range of widths in a single pickling unit are advantages claimed for a continuous pickling outfit recently installed by a Connecticut manufacturer of cold rolled strip. The pickling equipment was installed primarily to improve the quality of the finished strip, and also to permit the company to produce a cold rolled product in the longer lengths which the trade demands.

The surface scale is loosened by passing the strip through a breaking machine before it goes into the pickling tank. This operation makes pickling easier and faster and reduces the amount of acid required.

The pickling speed is 40 ft. per min., which is claimed to be much faster than the pickling could be done without previous passage through the breaking machine. The pickling equipment handles strip in all widths up to 28 in., and is designed as an economical unit for use in cold rolled strip plants having small capacities.

Another feature of the installation is a brushing machine having revolving brushes between which the strip passes. This operation follows the cold water rinse, and the purpose of the brushes is to remove acid and grit from the surface of the steel. The resulting product has a bright clean finish which produces brighter and better strip upon cold rolling.

The continuous procedure for cleaning hot strip has for some time been generally recognized as preferable to the batch pickling method. In the latter case the coils of strip were handled in and out of the pickling tanks with an overhead crane, but with the increase in weight and length during

the past few years it has been found that satisfactory cleaning could not be done with the old method, as the strands of material would touch thereby causing scale spots which would show up in the cold rolling. With the continuous pickling method, however, the danger of these scale spots is eliminated and steel of better quality is produced. Continuous pickling of long lengths is said to be

cheaper than the old method, which requires the opening up of coils to allow acid to work on each strand, whereas the coils in the continuous unit, as they come from the hot mill, are drawn through the cleaning equipment by various mechanical devices, and a uniform clean surface ensues.

The steel strip in the Wallingford plant first passes through an acid tank, after which it is rinsed in cold

Pickling Strip Steel in a Continuous Unit

By F. L. PRENTISS
Cleveland Editor, The Iron Age

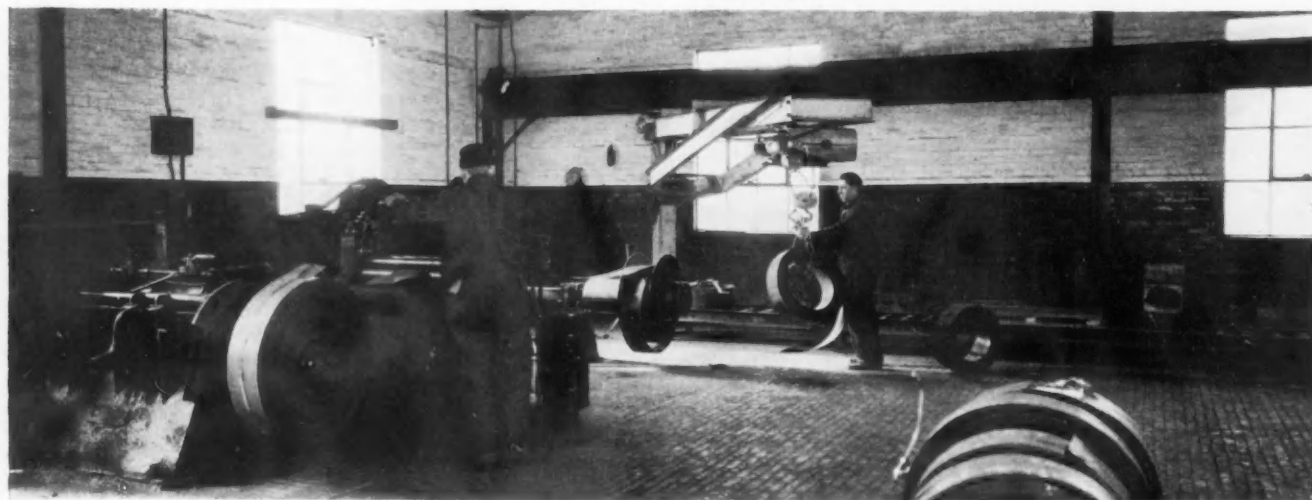
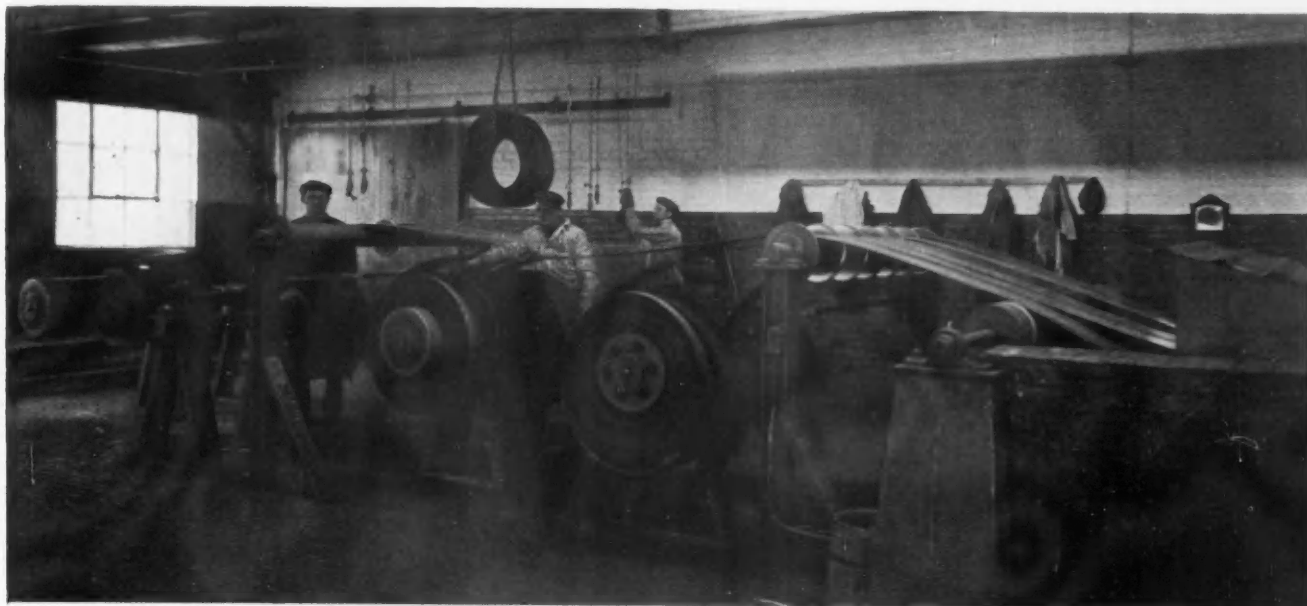


Fig. 1—Passage through the breaking machine is the first operation. This machine loosens the scale and facilitates pickling. In the background the crane is lifting the rolls from a gravity conveyor which brings the hot rolled strip from the stock house.



▲ ▲ ▲ Fig. 2—Pay-off reels from which the strips are fed into the pickling tank at the right.

water to remove the acid. It then goes through the brushing machine which scours the surface of the material and removes any smut or dirt remaining on the strip, after which it is dried in a hot water bath. Beyond the hot water bath are the pull out rolls which draw each strip of steel through the tanks. From these rolls the strip passes to a 6-block take-up frame.

Scale Loosened by Breaking Machine

Loaded on cradles on a roller conveyor in the stock house the hot rolled coils move by gravity into the cleaning house as shown in the background of Fig. 1. On reaching the cleaning department an electric hoist mounted on a jib crane located above the roller conveyor picks up the coils and delivers them to pay-off reels from which the strip is fed into a 5-roll breaking machine, Fig. 1. The strip is run through this machine in order to loosen the scale and to facilitate the pickling operation. Tests have shown that this operation has paid for itself by a reduced amount of acid used, and a higher speed which increases production.

The breaking machine consists of three bottom and two top rolls which are each 2½ in. in diameter and 32 in. long. The roll housings are mounted on a heavy stand. The top rolls are raised and lowered by means of screw down mechanism which is motor driven for quick acting. A motor driven reel pulls the strip through the breaker rolls, and the reel block is of the collapsible type equipped with a coil pusher operated through an air cylinder.

The coils weigh approximately 400 lb. each when they come to the breaking machine, and, after leaving this machine, several coils are hooked end to end to make a large coil of about 1200 lb.

The coils of strip after breaking are transferred by an electric overhead crane to pay-off reels back of the acid tank, Fig. 2. The acid tank is 100 ft. long, 5 ft. wide and 36 in. deep inside measurements, and is

made of reinforced concrete heavily coated on the inside with asphalt cement and lined with vitrified brick laid up in Basolit. The top of the tub is covered with an asbestos steel cover, and hoods and stacks to collect the fumes are of the same material.

The cold water or rinse water tub is 8 ft. long, 5 ft. wide and 36 in. deep, and the hot water tub is 16 ft. long, 5 ft. wide and 36 in. deep. Both are made of wood. The general arrangement of the tanks and hoods is shown in Fig. 3.

The brushing machine, which is located between the cold and hot water tanks, consists of two 8-in. diameter Tampico brushes each backed up by an 8 in. diameter steel pressure roll. The brushes are mounted in a tilting frame while the pressure rolls are fixed. One of the brushes touches the top while the other touches the bottom side of the strip, and means of adjustment are provided to compensate for brush wear or to increase the brushing pressure against the strip surface. Each brush is driven by a 3-hp. alternating current, 720 r.p.m., direct connected motor.

The pull-out rolls in the center of Fig. 4 draw the strips through the cleaning equipment at a uniform rate of speed and delivers them to the take-up blocks which reel up the strip. The pull-out speed can be varied to suit conditions.

The pull-out consists of two rubber covered steel rolls each 24 in. in diameter and 60 in. long, which are mounted on a structural steel frame. The rolls are driven through a set of

SUCCESSFUL pickling is dependent upon the constancy of all the mechanical and chemical operations involved. This requisite is best fulfilled by an automatic and continuous unit, which steadily delivers a uniform product, and, in addition, saves floor space, eliminates excessive deterioration of buildings and equipment, and transforms a slovenly operation into an orderly manufacturing procedure. Automatic pickling is currently used for large castings and minute instrument parts, and the operation is generally superior to the tank process when it is required to handle a large number of identical parts. Obviously, strip steel lends itself readily to mechanical cleaning, and the accompanying article is a description of such a unit which was recently built by the Broden Construction Co., Cleveland, for the Wallingford Steel Co., Wallingford, Conn.



Fig. 3—The cleaning unit. The acid tank is at the extreme left, and next in order named are the cold water rinse tank, the brushing machine, and, in the foreground, the hot water tank. This picture, taken when the unit was operating, indicates the absence of steam or fumes in the room.

spur gears and a roller chain drive off of a main reduction unit.

The main drive of the pull-out rolls consists of a herringbone gear reduction unit connected to a Reeves variable speed transmission with a speed range of 6 to 1, using a 25-hp. alternating current constant speed motor. This arrangement permits the passage of the strip through the tanks at a speed of 10 to 60 ft. per min.

The take-up frame, shown in the

background of Fig. 4, has six blocks of the collapsible type, 16 in. in diameter, three having an 8-in., two a 12-in., and one a 28-in. face. The blocks are staggered in the usual manner permitting six strands each 9 in. wide, or three strands each 12 in. wide, or a single strand 28 in. wide to be reeled up. Each block is equipped with a coil-pusher operated through a 6-in. air cylinder.

A hand operated compression clutch

is used for starting and stopping each block, and a friction slip device in the back of the block permits the block to slip thereby synchronizing the surface speed of the coil as it builds up on the block, with the speed at which the pull-out rolls deliver the strip. The block spindles are driven through roller chains from the main reduction unit, and guide rollers are provided on top of the take-up frame for feeding the strip onto the blocks.



Fig. 4—Pull-out rolls, shown at the center of the picture, draw the strips through the tanks at a constant but adjustable speed and deliver them to the take-up blocks at the right.

New Things in Materials and Processes

By EDWIN F. CONE

New Method of Deseaming Billets

THE deseaming of billets and other similar material by the use of the oxy-acetylene torch is claimed to be gaining in favor rapidly. It is asserted that not only is the removal of seams and other defects much more quickly accomplished than by the use of pneumatic tools but also the number of men required is radically reduced. There is thus involved a decided lowering of costs accompanied, it is claimed, by better results.

Steels of 300,000 lb. Tensile Strength

SOME interesting testimony has recently been published as to the proper composition of steel which will have, after heat treatment, a tensile strength of 300,000 lb. per sq. in. This is, of course, an unusually high figure to attain. The testimony referred to which came from the International Nickel Co's experts, designated three such steels to meet such a demand.

One in particular has the following recommended composition: Carbon, 0.50 per cent; manganese, 0.80 per cent; silicon, 1.65 per cent; nickel, 3.00 per cent. When oil quenched from 1550 deg. F. and drawn at 600 deg. F., it showed a tensile strength of 300,000 lb. per sq. in., an elongation of 9 per cent and a reduction of area of about 30 per cent. Not being regularly on the market, this steel would have to be made specially to order.

Two other steels suggested as having a tensile strength of 300,000 lb. per sq. in. are a Ni-Mo and a Ni-Cr-Mo steel. Both have a carbon content of 0.45 to 0.55 per cent and a manganese percentage of 0.40 to 0.75. The nickel in each case is 1.50 per cent with the molybdenum in the Ni-Mo steel at 0.20 to 0.30 per cent. In the Ni-Cr-Mo steel, the chromium is 0.60 to 0.90 per cent and the molybdenum 0.15 to 0.25 per cent.

The heat treatment of this Ni-Mo steel (S.A.E. 4650) is oil quenched at 1450 to 1550 deg. F. and tempered at not above 400 deg. F. For the Ni-Cr-Mo steel, it is stipulated that it shall be oil quenched from 1475 to 1525 deg. F. and drawn at 400 deg. F. or lower.

Doubtless there are other combinations of alloying elements which will also give a tensile strength of 300,000 lb. after proper heat treatment.

Aluminum Alloys in Bridges

AN illustration in a recent issue of the *New York Times* showed the replacing of steel girders and plates with "aluminum girders and sheets," with the statement that a saving of 750 tons in weight was realized in a Pittsburgh bridge. Of course, aluminum alloy girders and plates were meant and this is one of frequent examples of misleading names used by the daily press to convey scientific facts.

While there is nothing new in the possible substitution of aluminum alloys for steel in certain circumstances, its use in bridges is not common. Some of these alloys have physical properties fully equal to steel. This, combined with lightness, proves a decided advantage, outside of the element of cost. In the construction of the stream line Union Pacific train, aluminum in some form largely enters.

But there is also the demonstrated use of the stainless steels. Thin forms of this material have been used in the construction of similar cars and trains, combined with the use of alloy steel tubing, such as chrome-molybdenum. In this case, lightness and adequate strength are combined together with superior anti-corrosion properties.

New alloys, whether of aluminum or steel, are constantly appearing and further developments in the field of light construction are certain. It is evident, however, that there is to be

lively competition between aluminum alloys and steel alloys, not only for bridges, trains, airplanes and so on, but for other applications in industry.

Pouring Intricate Stainless Steel Castings

ONE of the progressive steel foundries of the country has devised a special method of pouring very small castings of stainless steel. The conditions insuring success demand a metal of high temperature poured as quickly as possible. Ordinarily it is the custom to tap the metal into a ladle by which it is transferred to the molds and poured. The nature of some of the castings to be made has been so intricate in design that this method of casting was unsuccessful, despite the fact that the temperature, as melted in an Ajax high frequency furnace, was all that could be desired.

To overcome the difficulty encountered, apparatus was devised by which it is possible to pour the castings direct from the furnace without transfer to a ladle. The molds are successively brought to the furnace by special handling mechanism so that each casting or group of small castings is poured at once directly from the furnace.

The successful production of the many types of stainless and heat-resisting castings is not easy. The problems involved are more complicated than in the case of the lower alloy or plain carbon steel castings. The advance which has been registered in this field is one of the outstanding foundry achievements of the past few years.

Improving Medium Manganese Steel

AN alloy steel which has gained much favor in recent years is that commonly known as medium manganese steel, containing from 1 to about 1.75 per cent manganese. It has many desirable physical properties. There have been some instances where this steel meets all the severe specifications demanded both as to physical properties and in drawing or working with the exception of tensile strength.

It has been found that, by adding to the medium manganese steels, an appreciable and suitable proportion, usually small, of another alloying element, such as nickel, chromium, vanadium or molybdenum, the ultimate tensile strength is elevated to the desired level without sacrificing other properties. Thus the medium manganese steels with the added alloy are found to meet certain heat-treating and other conditions which they otherwise could not meet and also to take the place of some more complicated steels which sometimes develop difficulties under certain heat-treating conditions.

Use of Gas in a Pittsburgh

FROM J. B. Nealey of the American Gas Association has been obtained the following detailed information of the use of gas for fuel in the North Side, Pittsburgh, plant of the Pittsburgh Screw & Bolt Co., an institution that has supplied bolts for armor plate, bolts for the New York-New Jersey vehicular tunnel as large as 6 in. in diameter and 25 to 50 ft. long, including chrome-nickel products to possess a tensile strength of 125,000 lb. per sq. in., and at the present time long threaded rods to be used spirally as reinforcing in the concrete walls of a water tunnel being driven under New York City.

The end forging division of the North Side plant has 30 slot type gas fired furnaces. Two are equipped with motor operated conveyors for moving the work across the front with one end of the steel projecting into the furnace through the slot. The conveyor consists of two looped chains adjustable to regulate the distance between the chains for different length rods. The furnaces have 10-ft. hearths

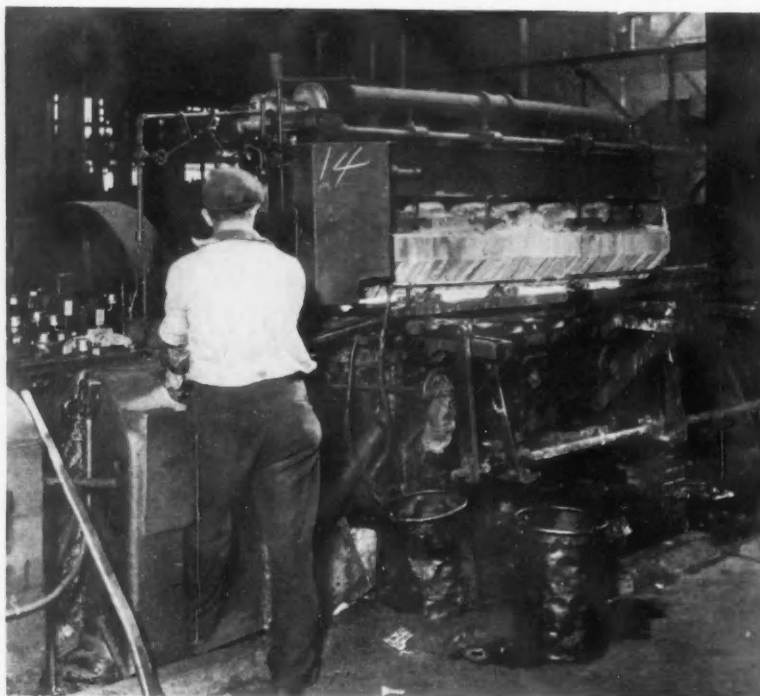
and the conveyor extends some 3 ft. beyond for loading. The conveyor is loaded manually and the hot stock is discharged upon the table of a semi-automatic heading machine at the other end. Heat is supplied to each furnace by six gas burners located in the front wall and underfiring the work.

Most of the end forge furnaces have 60-in. hearths and consist of steel plates bolted together into a case which is lined with firebrick. They stand on legs to bring the slot to a convenient level for the operator. For the most part these units are fired with three nozzle-mixing gas burners each. A burner consists of two pipe like castings, one within the other. Air forced at 1½ lb. pressure through the inner casting entrains gas at 6 oz. in the outer casting by means of perforations in the wall of the inner casting. The proportion of gas and air is regulated by valves to provide complete combustion. One motor-driven blower furnishes air for a number of these furnaces through one long

duct with a takeoff duct to the air manifold of each furnace. Upsetters in this group have a capacity for 800 pieces of 1-in. stock or 1000 pieces of ¾-in. material an hr.

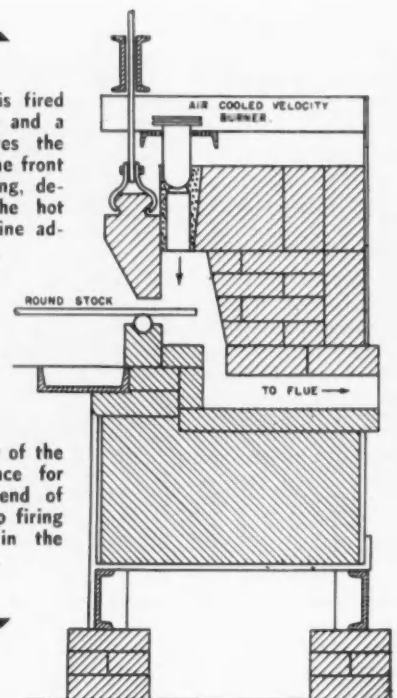
While the end firing method of heating these furnaces predominates, a novel improvement has been introduced in two or three by placing the burners in the top, so that they fire straight down on the work. The height of the burners is so regulated that the hottest part of the flame is in direct contact with the work.

The burners are of the premix blast type and this method of firing has shown a considerable saving in fuel consumption with equal performance over furnaces in which burners of the same type were located in the back wall. Furnaces in which the burners are placed in the rear wall, however, give satisfactory service. One of these is for large work, has a 9-ft. hearth and is fired with three gas burners. It too is of the slot type. Ends of rods more than 50 ft. long



The furnace is fired from the top and a conveyor moves the work across the front for end heating, delivering to the hot heading machine adjacent.

The simplicity of the forge furnace for heating the end of stock with top firing is indicated in the sketch.



Bolt and Nut Plant

have been heated in this furnace for upsetting.

In the heat treating department are four rotary gas fired furnaces each 20 ft. long and 4 ft. in diameter. An inside helical screw causes the work to progress through as the furnace revolves while a single gas burner in the discharge end furnishes heat on the counterflow principle. A conveyor brings the material in and an elevator hoists and dumps it into the furnace, while an 8-ft. slide permits it to roll by gravity from the discharge end into the quench tank. Water from four sprayers is forced by centrifugal pumps upon this work (30-40 lb. pressure) as it moves to the tank. The quench tank is provided with a rotating perforated steel cylinder, set at an angle and this moves the work through the quench and discharges it over the end into tote boxes for further handling.

There has just been erected in this division, a heat treating furnace, that is used alternately for hardening and drawing. It is of the continuous belt conveyor type, brick and steel con-

struction, 21 ft. long, 8 ft. wide and 9½ ft. high. There are two chambers, one into which the gas burners fire from the sides, being located directly above the other in which the work is heated. They are separated by an arch and the hot products of combustion pass down through ports.

The heated gases continue down through the work and alloy mesh conveyor into ducts in the side walls and are exhausted to a stack. There are eight gas burners on one side and two on the other, all firing into the combustion chamber. Two supplementary burners fire directly into the heating chamber.

The firing system is controlled in two parts so that the heating furnace naturally divides off into two zones, preheat and high heat. This is accomplished by manifolding the burners into two sets and applying an automatic temperature controller to each. Air is furnished by a blower at 1½ lb. pressure. The controllers, of the potentiometer type, are connected to motor operated valves cut into the two air manifolds. The two burners

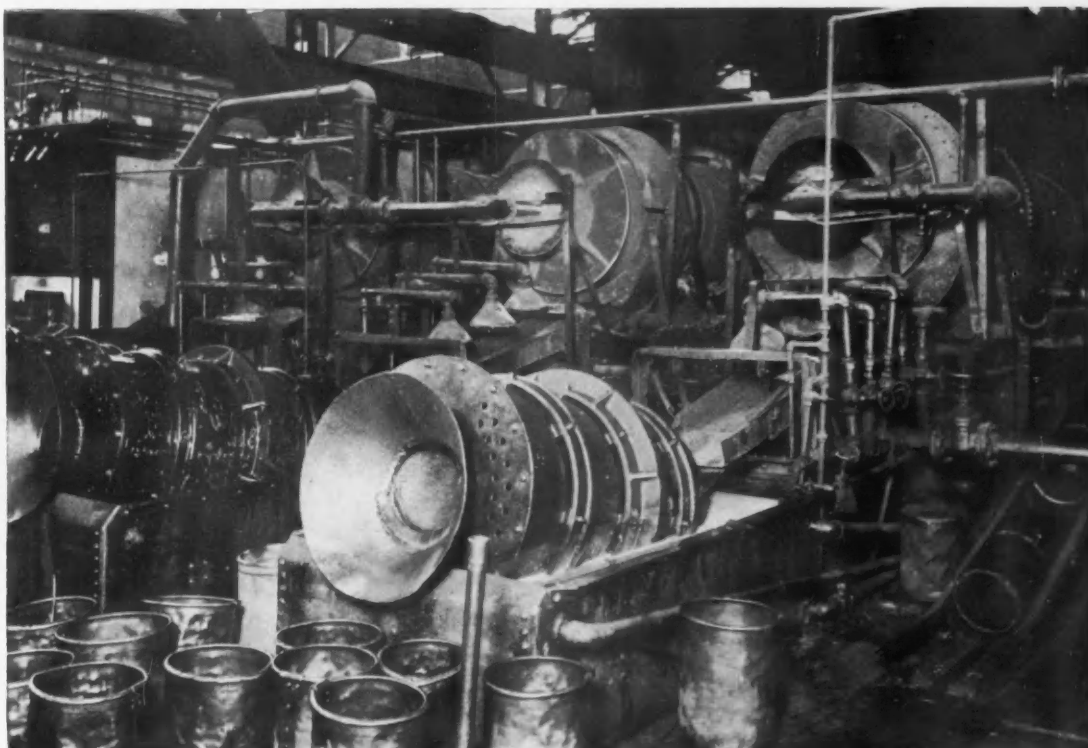
on one side of the furnace are piped to one of the manifolds on the opposite side where the other eight are located. One indicating and one recording pyrometer are provided for the preheat and high temperature zones respectively.

The discharge end of the furnace is closed, the work dropping through an opening in the hearth, through a chute, directly into the quench tank located below in a pit. This is a steel tank 12 ft. long, 5 ft. wide and 4 ft. deep and is equipped with a motor driven flight conveyor. This moves the work up over the far edge, dropping it into tote boxes for further handling. Oil, water or a soda compound can be used for the quenching medium, in which case the chute forms an air seal. If the work is to be drawn only, the liquid is removed from the tank and the operation of the furnace is the same as before, except that a lower temperature and a different time cycle are employed. Both the oil or soda compound are pumped to the quench tank from separate storage tanks and returned

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The rotary annealing furnaces carry the products through the inside by means of a helical screw, a single gas burner is located at the discharge end, the products are sprayed as they slide down the chute into the quench tank and a rotating perforated cylinder lifts the products into the tote boxes.

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after using. The water is also pumped in but is wasted after using. This furnace is capable of hardening material at the rate of 1500 lb. hourly with a gas consumption of approximately 1500 cu. ft.

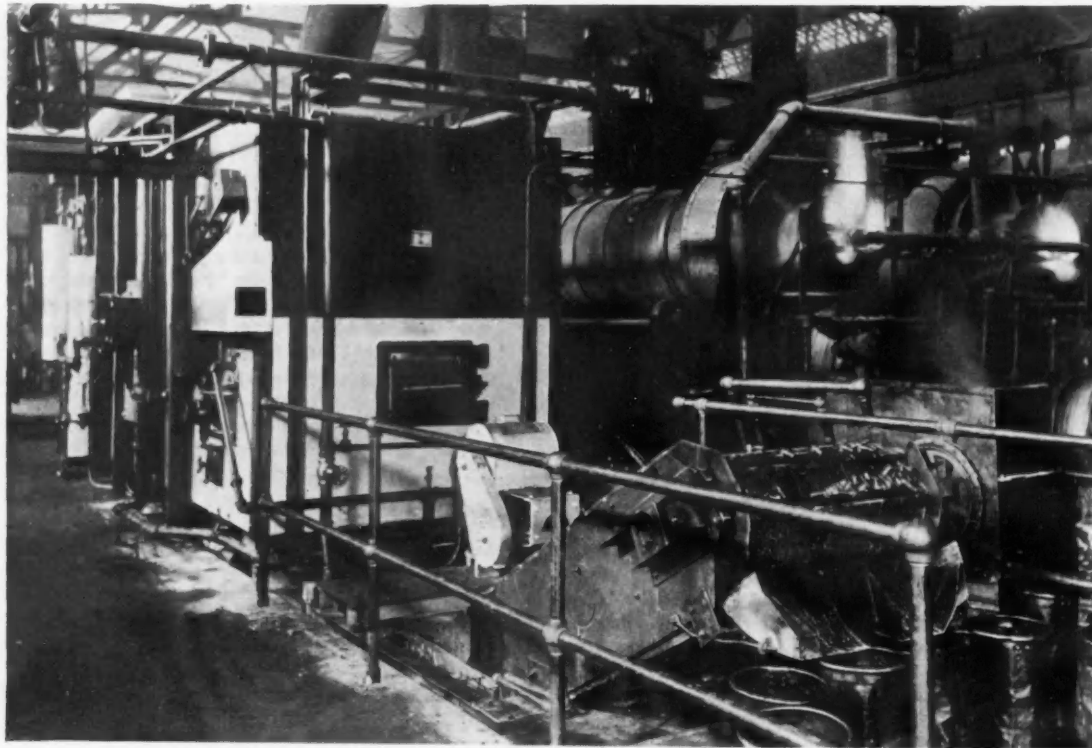
Among the various machines developed by the company is one for forming nuts cold from bar stock. The care with which these are made can be gaged from the fact that 7 different dies are employed. These

are arranged in two groups with three on one side of the machine and four on the other. These nuts are given a black finish when necessary in a rotary gas fired furnace.

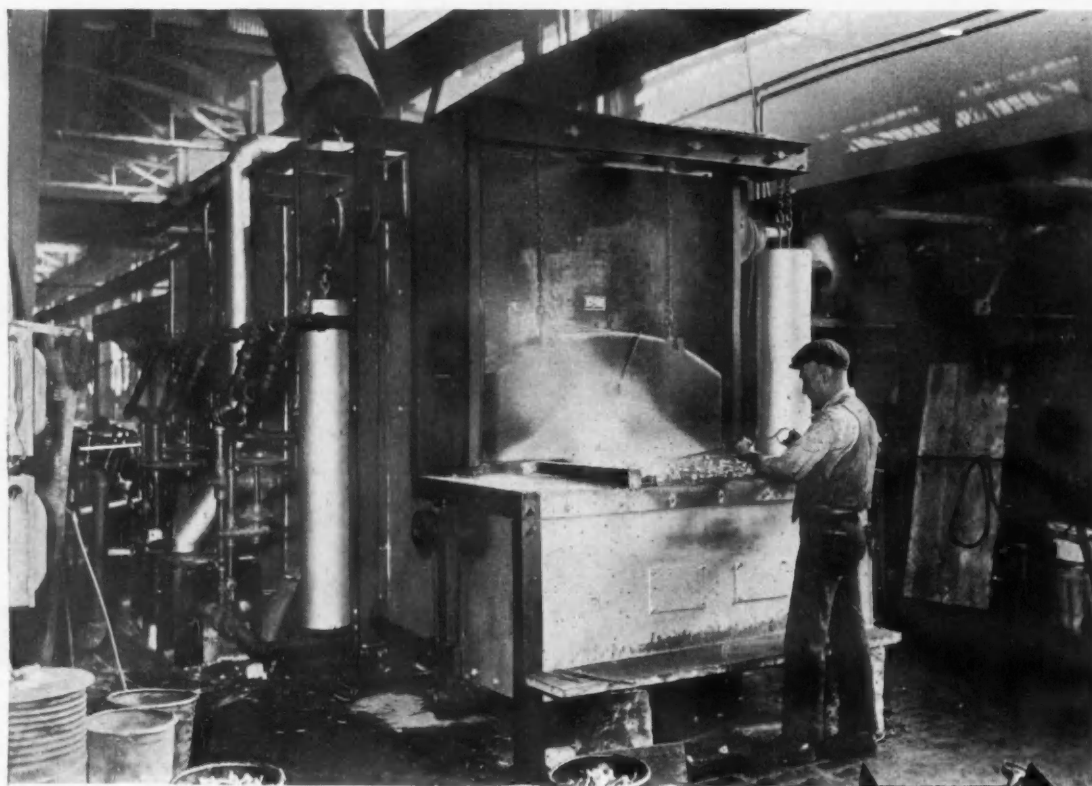
All standard size bolts and nuts are cleaned in a perforated rotating steel cylinder 15 ft. long and 6 ft. in diameter. Half of this cylinder is enveloped in a sheet steel housing in which the hot water sprays and tank are located. Centrifugal pumps force

this water from the tank through the sprays and the waste water runs back into the tank. The water is heated by a gas fired 100-gal. storage water heater equipped with an automatic temperature control.

The central heat treating department has five gas fired furnaces. Recording and visual pyrometers are grouped on a central control board by which the temperatures of the furnaces are checked from time to time.



One heat-treating furnace, alongside the rotary furnaces, is used alternately for hardening and drawing. It employs a continuous belt conveyor. The view of the charging end shows the gas firing systems, control apparatus, etc. The discharge end extends over the quench tank and a flight conveyor removes the work.



Develops Machine for Testing Lead of Helical Gears

THE Lees-Bradner Co., Cleveland, has brought out a machine which accurately measures the helix angles or the lead of helical gears, and also calibrates the machine settings.

The only positive method of measuring helical gears, it is stated, is one in which a point of contact with the gear tooth is moved relative thereto across the gear face and at a uniform distance from the gear axis while imparting to the gear being tested an angular or rotative motion equal in extent to exactly one complete revolution while the contact point is moved through the exact distance of the lead.

The lead of a gear is a constant quantity, no matter where on the tooth measurements may be taken; hence, when the lead is found to be correct the helix angles must of necessity also be correct. The Lees-Bradner testing machine employs the last mentioned method of checking lead or helix angles.

The gear being tested is mounted between centers. An adjustable tooth contactor connected to a direct-reading ten-thousandths inch indicator is mounted on the carriage at front of the machine. This carriage also carries an angularly adjustable straight-edge and is traversed on the bed parallel to the head and tailstock center. The headstock is provided with a spindle mounted on self-adjusting precision ball bearings. This spindle also carries carefully calibrated, ground involute cam. The headstock is further provided with a transverse cross-slide, one end of which mounts a precision and fully adjustable roller which maintains contact with the involute cam on the spindle. The other end of this cross-slide is provided with adjustable shoes or contact members which engage the angularly adjustable straight-edge mounted on the indicator carriage. The angular adjustment of the straight-edge is set according to the lead of the gear being tested.

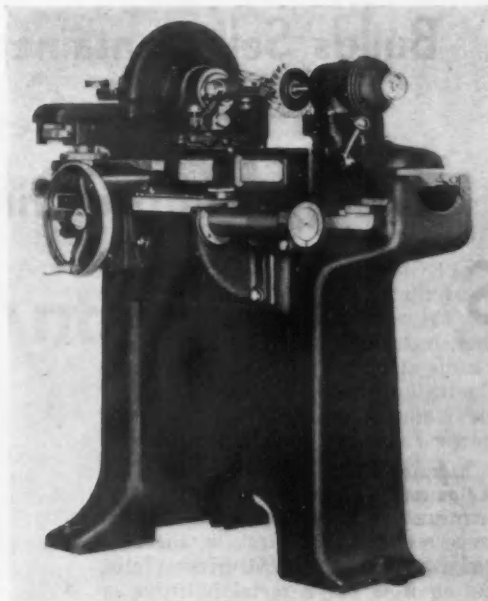
In operation, the tooth contactor is adjusted into position with one of the gear teeth, and the indicator carriage is traversed parallel to the gear axis by means of the handwheel at front of machine. As the indicator carriage is traversed, carrying with it the angularly adjusted straight-edge, the transverse cross-slide on the headstock is caused to move at right angles to the work spindle. This movement causes the roller mounted on the cross-slide, and in engagement with the involute cam, to rotate the spindle and the gear being tested. Thus simple, straight-line motion of

the indicator is accurately converted into rotary motion of the spindle and gear by the fewest number of accurately made parts.

Any deviation from true lead of the gear is registered directly on the indicator in ten-thousandths of an inch.

To insure that the indicator reading of the gear tooth is a true representation of the deviation from theoretical, provision has been made in the machine for accurate calibration of the rotary motion of the work spindle relative to a known distance traversed by the contactor in engagement with the gear tooth. It is not considered sufficient with the delicate measurements being made to assume that the angular adjustment of the straight-edge, accurately as it may be set, will assure accurate readings. To overcome any possibility of error in machine settings, a method has been provided for checking the angular rotation of the work spindle and the linear distance traversed by the tooth contactor. The rear of the work spindle has been provided with ground index plate engageable by a direct-reading ten-thousandth inch indicator. On the front of the bed there is a V-block in which an adjustable stop is located. This stop may be located in a number of positions in the V-block. The front of the indicator carriage is provided with an adjustable holder on which is mounted another direct ten-thousandth inch indicator.

After the straight-edge on the indicator carriage has been adjusted according to the lead of the gear being tested, the indicator engaging the index plate on the rear of the work spindle is swung into engagement with one of the notches of the index plate and the indicator dial set to a zero position. A set of precision gage or measuring blocks is then placed into position in V-block at the front of the machine with one end thereof positioned against the stop. The indicator at the front of the carriage is then adjusted to bear against the other end of the gage blocks with the indicator dial set at zero. The indicator engaging index plate at the rear of the work spindle is now swung out of position and the gage or measuring blocks removed from the machine. The work spindle and index plate are caused to rotate through an angular distance of one or more divisions, checking this by swinging the indicator back into position. The



Lees-Bradner machine for checking the lead of helical gears. It may be calibrated accurately before testing.

distance traversed by the indicator carriage and tooth contactor is now checked by again inserting measuring blocks in the Vee between the stop and indicator at front of carriage. Since the index plate at the rear of the work spindle is provided with 20 divisions, the linear movement of the tooth contactor can be checked, if thought desirable, for each twentieth of the length of lead.

Thus, the machine not only accurately checks the lead, or helix angle, of helical gears, but also may be calibrated accurately before such test of the gear is made.

New High-Temperature Insulation Block

FOR insulating open-hearth and glass tank regenerators, hot blast stoves, high-temperature boiler furnaces, ceramic and rotary cement kilns and high-temperature metallurgical furnaces in general, Johns-Manville, 22 East Fortieth Street, New York, has developed a new insulation block to withstand safely temperatures up to 1900 deg. F. It is known as Superex and represents the use of a special calcined diatomaceous silica, the same basic material used in the Johns-Manville Sil-O-Cel insulating products. Like the previous Superex, asbestos fiber is employed for bonding. Besides increased insulating value, the new block has a relatively low density.

French production of pig iron in 1933 totaled 6,328,000 metric tons, an increase of 14.3 per cent over 1932, and steel output climbed to 6,519,000 metric tons, which represented a 15.6 per cent increase over the previous year.

Builds Self-Contained 1000-Ton Hydraulic Press for Making Rubber Printing Plates

SPECIAL hydraulic equipment built recently by R. D. Wood & Co., Wood Building, Philadelphia, includes the self-contained 1000-ton die sinking and vulcanizing press illustrated, which was designed for the manufacture of rubber printing plates.

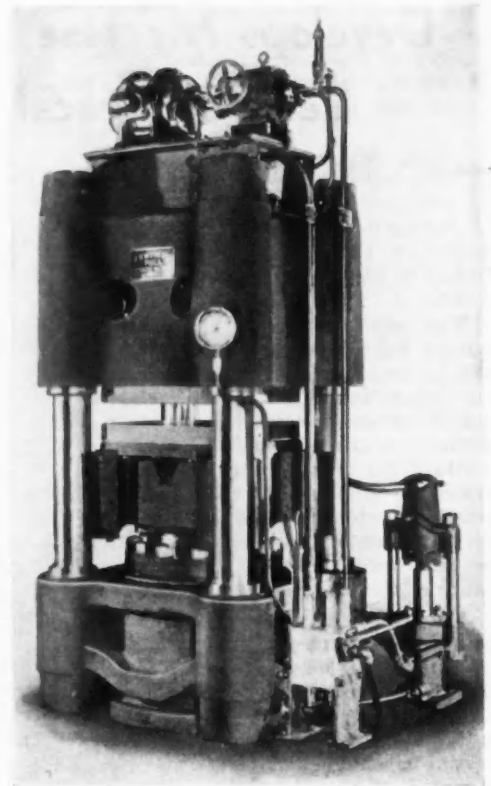
Making of these plates, which are being used increasingly for special printing work, involves two distinct processes. In the first, a sheet of lead is placed upon the press platen and on it is put a metal halftone or engraving. The press is then closed under the required pressure, producing a negative of the original in the lead plate. With this negative or mold still on the platen, a rubber compound is applied to it and the press then closed again. In this second process the rubber is vulcanized by means of heated platens. After the vulcanizing the finished plate is removed ready for the printing press.

Obviously, to assure faithful reproduction of the original engraving, which often has only "hair line" designs, the press for this work must be extremely rigid and have a wide range of power and vulcanizing temperature. As to the first requirement, it is claimed that the total deflection of the machine illustrated has been held to 0.001 in. even under maximum load. The pressure range is from 100

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Pressures up to 450 tons are obtained by a radial piston pump and higher pressures by a hydraulic intensifier at the side of the machine. Hot plates are electrically heated. Total deflection of press has been held to 0.001 in.
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to 1000 tons, and vulcanizing temperatures are closely controlled over a wide range through the use of electrically-heated hot plates.

Pressures up to 450 tons are obtained by a variable-pressure radial piston pump and higher pressures by means of a hydraulic intensifier. The radial piston pump with direct-connected $7\frac{1}{2}$ -hp., 1150-r.p.m. motor is mounted as a unit on top of a welded



steel suction tank located on top of the press, as shown. Nitralloy parts are used throughout the pump to assure long wear.

The intensifier, located at the side of the machine, raises the pump pressure from 3000 lb. to a high pressure of 6350 lb. per sq. in. A spindle-type operating valve with single hand-lever entirely controls the operation of the press.

Carboloy Cutter for General Milling

FOR general-purpose use on cast iron, non-ferrous and non-metallic materials the Carboloy Co., 2495 East Grand Boulevard, Detroit, is offering the Carboloy face milling cutter illustrated. The tool is 5 in. in diameter and may be used over a wide range of cutting area. On short-run, diversified milling jobs the one standard cutter may be employed interchangeably in the same manner as a high-speed steel cutter. It is not intended to replace special Carboloy cutters on quantity-production jobs, as on such work the most efficient results are obtained with cutters especially designed for maximum performance on the particular job.

To make a general-purpose cutter practical for short-run, highly diversified milling of many different kinds of materials, modified designs are employed to give economical results without the large increases in speeds, etc., common to Carboloy milling on a

quantity production basis. The benefits of cemented-carbide milling on the large production jobs are said to be



obtained, however, to an extent that permits a substantial saving on general milling work. These include greater accuracy, improved finish, longer cutting life between grinds, milling of hard materials and the combining of rough and finish cuts.

Trade Notes

Diehl & Co., 2 West 89th Street, New York, have established export department handling new machinery developments. Company also exports all types of steel products, metals, tools, and hardware.

Geuder, Paeschke & Frey Co., Milwaukee, stamped and pressed metal division, has made the following appointments: Arnold L. Nacke, 50 Church Street, New York, for the Metropolitan district; G. Douglas Morse, 542 High Street, West Medford, Mass., for the New England district, and Gustav A. Reinhard, 1935 Euclid Avenue, Cleveland, for the Cleveland district.

Beckwith Machinery Co., Pittsburgh, has been appointed distributor for sale of high pressure jenny, manufactured by Homestead Mfg. Co., Coraopolis, Pa., in 16 counties in tri-State area around Pittsburgh.

The Wagner Bill—a Charter of Permanent Class Antagonism

By G. L. LACHER
Managing Editor, THE IRON AGE

THE Wagner labor disputes bill is intended to "equalize the bargaining power of employers and employees." Examination of its provisions discloses that it would do far more than that. By enforcing the closed shop it would give labor not equality in bargaining but unrestrained power to enforce its will on employers.

Conceivably employers might follow the policy of acceding to labor's demands and passing the increased cost on to the public, and this very thing has happened in various industries in the past, notably the railroads and the building trades. But such a practice could not become general without arousing public opinion and forcing the Government, which sponsored the creation of a labor monopoly, to regulate that monopoly in the public interest.

No Restrictions on Union Activity

The Wagner bill imposes numerous prohibitions on employers, but places no restrictions on any labor union activity. Though employers are required to make agreements with unions, or at the very least "to exert every reasonable effort" to do so, there is no provision whatsoever under which the unions can be forced to abide by such agreements. This is clear from Section 303, which states that "nothing in this act shall be construed so as to interfere with or impede or diminish in any way the right to strike." The unfairness of a law which enforces agreements on one party only is patent to any unbiased observer. But even if the unlimited right to strike should be sustained in the courts, a coextensive unlimited right to lockout would have to be recognized. Thus the one remaining defense of the employer against unfair union practices would be the extreme measure of shutting his plant doors.

Past Defenses Against Union Excesses

This would be in sharp contrast with remedies that have been available to employers in the past. In cases where the unions have threatened strikes in violation of agreements,

courts have granted injunctions restraining union officers from issuing strike orders, and these injunctions have usually been effective. While the injunction has been a favorite object of attack by union leaders, it has been resorted to in labor disputes because damages are difficult to recover from a union, and often would not make good the loss suffered by the employer.

Unions are unincorporated associations and, under the common law, are regarded as partnerships. In the Danbury Hatters case (1915) damages were granted in a suit against a national union for carrying on a boycott in restraint of trade. But in default of payment by the union the plaintiff was compelled to proceed in a separate action on the judgment against individual members. Such action at law is highly uncertain in view of the probable necessity of subsequent suits against numerous individuals, to collect what each can pay until the total judgment is collected. In the Coronado Coal case (1922) the United States Supreme Court held that an unincorporated union could be sued. Damages were not granted, however, because the defendant, the United Mine Workers, had not sanctioned the local strike which led to the losses suffered by the plaintiff.

A judgment against a union as a body does not solve the difficulty of recovering adequate damages. Union treasuries are not always large; sometimes they may be difficult to locate either because of irregular practices or a studied effort to protect funds from contingencies of this sort. One expedient is to keep funds in the personal account of a union officer, bonding him to prevent his diverting them for his own use. Where funds cannot be found to cover a judgment, the court can, of course, attach union dues. But if the amount of the judgment is large, the obvious

move of the union is to disband and to reorganize under another name.

Bill Does Not Equalize Responsibility

At best, the difficulties of enforcing agreements on organized labor are great. The lack of responsibility traditionally characteristic of unions is one of the chief causes for the widespread distrust of organized labor among industrial employers. Although the preamble of the Wagner bill asserts that its purpose is "to equalize the bargaining power of employers and employees," it says nothing about equalizing responsibility. Yet the grant of monopolistic powers to the unions clearly implies the imposition of real responsibility. As Walter Lippmann has pointed out, no government can create or permit a monopoly, without being forced sooner or later to regulate it. The industries of Italy have been required to adopt the closed shop, but the restrictions imposed on the unions by the government are stringent, prohibiting strikes and barring any moves by organized labor groups without the final approval of Rome.

"Unfair Labor Practices" Banned by Bill

The Wagner bill purports to "encourage the amicable settlement of disputes between employers and employees. Yet it virtually bans direct, friendly relations between management and men. It prohibits employers from bargaining or negotiating with their own employees. It specifically declares it to be "unfair labor practice" for any employer—

1. To attempt by interference, influence, restraint, favor, coercion or lockout to impair the right to join a labor organization and engage in concerted activities for the purpose of organizing and bargaining collectively.
2. To refuse to deal with representatives of employees and to fail to exert every reasonable effort to make and maintain agreements with them.
3. To participate in any way in the formation or management of a labor organization.
4. To contribute financial or other ma-

terial support to any labor organization by compensating anyone for services performed for such a body.

5. To discriminate in terms of employment conditions so as to encourage membership or non-membership in any labor organization, *provided that nothing shall prevent an employer from requiring an applicant for work to join a union, if that organization is composed of a majority of his employees and if the agreement with the union does not exceed a year.*

Would Invite Unprecedented Industrial Strife

Thus the bill specifically indorses the closed shop. This is in direct conflict with principle No. 2 of the President's settlement of the automobile controversy which provides for proportional representation of different labor groups. It goes without saying that the measure, if passed, instead of encouraging "amicable" relations, would invite unprecedented industrial strife. It would provoke concerted action against every employer who is not operating under a closed shop agreement. While the constitutionality of the measure is highly doubtful, a court test might take several years. In the meantime the prohibitions in the law would operate against employers only. Violation of any of the "unfair labor practices" listed would be a statutory offense with administrative penalties applicable to employers alone. No obligations whatsoever are imposed on employees or labor organizations. No union activity is declared an "unfair labor practice."

Labor Board Could Persecute Employers

The powers given the National Labor Board to discipline employers under the bill would be the most drastic ever entrusted to a public body in this country. Upon the receipt of any information, *even a mere rumor*, suggesting violation of the act, the board or any member, or any agent of the board designated for that purpose, could subpoena an employer to appear before it or one of its examiners within 24 hr. The complaint would be returnable within that time *anywhere in the United States*. The original complaint would not limit the scope of the inquiry. If the evidence should indicate violations of the act other than those cited in the original complaint, the complaint could be amended. In fact the complaint might be amended *at any time* before the issuance of an order, even after the alleged offender had completed his testimony and boarded a train for his home city. An employer might literally be charged with one thing and convicted of another. The board or its agent, under the provisions of the bill, may receive anything in evidence and may hear argument at its discretion. Witnesses may be called regard-

less of their competence or the relevance of their testimony. To make it clear that the board shall have these extraordinary powers, the bill specifically states that neither an examiner nor the board shall be bound by the rules of evidence prevailing in courts of law or equity.

Pillorying an Employer with Unofficial "Findings"

Even more unfair to the employer is a provision under which the board may publish its findings in a case, regardless of whether it has power to write an order, which is limited to cases in which the board finds that an employer has engaged in an "unfair labor practice" which tends or might tend to obstruct or burden interstate commerce. This authority is granted in Section 204 (b) which empowers the board to hold hearings in any labor dispute.

The dangers of abuse under this clause are great. The board may pillory an employer with impunity, doing irreparable damage to his reputation and his business, and yet giving him no recourse except to make a public denial of the charges, which may or may not get appropriate publicity in the press.

Rank Injustice in Name of "Social" Justice

The rank injustices which the Wagner bill threatens to impose upon American employers are sponsored in the name of "social justice." What is social justice? Are American businessmen forever barred from participating in that particular form of justice?

The hysteria of our social reformers has created extraordinary illusions. One of the most regrettable is that every employer of labor is a big bad wolf ready to spring on the unsuspecting. We hear much about the special privilege of combination given industry under the National Industrial Recovery Act and that it is only fair to allow labor a similar opportunity to combine to promote its interests. Yet the supposed advantages to industry under the NIRA are proving illusory. Although business was specifically authorized, under a temporary exemption from the provisions of the anti-trust acts, to unite in a suppression of destructive price cutting, the law also prohibits any acts tending to promote monopoly or to oppress or discriminate against small enterprises. Now we find that what the steel industry has done in compliance with one part of the law is being viciously attacked as in violation of another part of the act. The fact that steel manufacturers have materially raised wages and spread employment, though still operating at a loss, is not considered. The fact that labor has been the chief beneficiary of all that has been done to carry out the purposes of the re-

covery act is ignored. Apparently no good can come out of Israel. Industry is damned if it does and damned if it doesn't.

Business Must Be Allowed to Function

Is it any wonder that business men are beginning to despair of ever seeing a return to sane thinking and calm counsel? They know that the first essential to recovery is that business be allowed to function. This simple but fundamental principle has been overlooked by social reformers the world over. It is significant that there has been a violent reaction against excessive socialistic extravagance and meddling in Italy and Germany. In the last analysis people must live. The confusion of conflicting inciting "isms," the friction of class antagonisms and the unsettling influence of inexperienced experimentation must ultimately give way to order and concord so that the great and complex economic machine of modern society can operate.

Unless that machine is allowed to operate in something like normal fashion, there is no hope for any stratum in our population and, least of all, for labor. Labor cannot live on power, no matter how much it may win. And, paradoxical as it may seem, labor can defeat its own ends by gaining too much power. This has proved to be true in England, Germany, Italy, and even in the Russian republic of the proletariat, where economic necessities have taken all power away from the masses and concentrated it in a dictatorship.

When Labor's Voice Becomes the Union Boss's Voice

No one who is unbiased begrudges labor a voice in industrial relations. But those who have an eye to realities rather than to theories know that the voice of the working man is too often the voice of his union master. No employer doubts the reasonableness and fairness of his average employee, but experience has taught him to fear the conduct of those who make a profession of leading employees. The workmen in the plant and his employers have a common interest in the success of the company, to which both groups owe their livelihood. Outside union leaders cannot and do not have such an interest. On the contrary, they make it their business to displace company loyalty with class consciousness. They harp on "company" coercion of labor and yet they themselves frequently resort to coercion to impose their will on labor. In some instances they transform unions into veritable rackets whereby they extort tribute from employers to line their own pockets. By imposing seniority rules, limiting output and opposing improved methods, they hold back efficiency and destroy individual incentive among workers.

Frozen classes are lacking in this

country and organized groups should not be permitted to promote such a rigid stratification of our society. The much maligned "company" union really owes its strength to the ingrained aversion of the average workman to class hatred and his natural inclination to be loyal to his immediate associates and to his plant.

Like most Americans the average employee is a "joiner." In the fever heat of a labor controversy he may join a national labor union. But he cannot be counted on to stay put. Unlike the European workman, he does not regard his present status as permanent. Promotion from the ranks or embarking on an enterprise of his own are always reasonable possibilities. In a word, he can always understand the employer's point of view. He has no class emotions.

The Wagner bill is an attempt to deliver all labor into the hands of the American Federation of Labor. It would nullify all the good work that has been done in recent years to lift industrial relations out of the rut of class conflict. Mutual respect, cooperative helpfulness and plant good will have no place in this proposed legislation. It is a charter of permanent class antagonism and as such is properly opposed by everyone who cherishes American institutions.

February Sheet Steel Sales Declined

SALES declined while production and shipments of sheet steel products in February reflected gains, according to the report of the National Association of Flat Rolled Steel Manufacturers, Pittsburgh. In this survey, which is based on figures covering a monthly capacity of 325,000 net tons, or approximately 59 per cent of the country's total capacity of 550,000 net tons, independent makers reported sales of 184,355 net tons in February, compared with 209,463 tons in January; production of 194,830 tons, against 163,622 tons, and shipments of 146,905 tons, compared with 130,878 tons. Unfilled tonnage on March 1 totaled 206,292 tons, or 63.5 per cent of capacity, compared with 166,182 tons or 51.2 per cent of capacity in the preceding month. The February report with comparisons of the two preceding months in net tons follows:

	Feb.	Jan.	Dec.
Sales	184,355	209,463	110,263
Production	194,830	163,622	113,111
Shipments	146,905	130,878	111,867
Unfilled orders	206,292	166,182	92,831
Unshipped orders	53,630	51,388	49,598
Unsold stocks	63,600	54,922	51,622
Capacity per month	550,000	550,000	550,000
Percentage reporting	59.0	59.0	59.0

Percentages, Based on Capacity			
Sales	56.7	64.5	34.0
Production	60.0	50.4	34.9
Shipments	45.2	40.3	34.5
Unfilled orders	63.5	51.2	28.6
Unshipped orders	16.5	15.8	15.3
Unsold stocks	19.6	16.9	15.9

Steel Warehouse Code To Be Heard—Revisions Planned for Others

WASHINGTON, March 27. — W. A. Harriman, acting division administrator, will preside at a hearing April 5 on the proposed code submitted by the American Steel Warehouse Association, claiming to represent 100 per cent of the volume of the trade. The code as now drafted has undergone three revisions and was submitted to the NRA on March 10.

Hearings will be held on April 6 on the proposed code for the manganese steel products industry and on the proposed supplemental code for the sheet metal distributing division of the wholesaling trade.

Machine Shop Group Seeks Revision

Amendments designed to clarify the definition of the industry and provide a method for meeting the expenses of the code authority were submitted for the approved code of the special tool, die and machine shop industry at a recent hearing. Fred Hewitt, representing the NRA Labor Advisory Board, stated that many machine shops throughout the country had the impression that the code did not apply to their operation, and asked that labor provisions of the code be opened for review by the Administration. Many employees of these shops, Mr. Hewitt stated, are working under more favorable conditions regarding payment for overtime than those set forth in the code, and any attempt to include such employees in this code would be opposed by the board.

Hack Saw Code Approved

A supplementary code of fair competition for the hack saw blade manufacturing industry, a division of the fabricated metal products manufacturing and metal finishing and metal coating industry, became effective March 27. Approval contained a proviso staying the waiting period between the filing with the code authority and the effective date of revised price lists or revised terms and conditions of sale. The stay is for 60 days or until after the completion of a study of open price associations now being conducted by the NRA.

New Codes Proposed

Public hearings have been announced for April 5, on three divisional codes under the fabricated metal products manufacturing and metal finishing and metal coating industry. They are for the file manufacturing, the spring manufacturing and the brass forging manufacturing industry. The codes are being handled by Division Administrator A. R. Glancy and the hearings will be in the Fairfax room of the Willard

Hotel. The proposed supplemental codes establish divisional code authorities, fair trade practices and cost accounting systems.

Modifications to Wire, Rod and Tube Die Code

Public hearing on proposed modifications to the wire, rod and tube die industry's code, approved Feb. 2, 1934, will be held on April 5, in room 126 of the Willard Hotel. The modification, proposed by the code authority, would permit an additional 8 hrs. a week for the skilled wire die makers due to a shortage of available workers, and is revocable by the administrator.

Brass Forging Code Hearing

Hearings will be held on April 5 before Division Administrator A. R. Glancy on supplementary codes for the file, spring and brass forging manufacturing industries, which come under the basic code for the fabricated metal products manufacturing and metal finishing and metal coating industry.

On the same day Deputy Administrator George S. Brady will preside at a hearing on proposed modifications to the anti-friction bearing industry code, which merely make clarifying changes in articles III and IV and at a hearing on a proposed modification to the wire, rod and tube die industry's code

Canadian Pig Iron Output Higher in 1933

FINAL statistics show that the production of pig iron in Canada during 1933 totaled 227,317 tons, as compared with 144,130 tons in 1932 and 420,038 tons in 1931. According to the Dominion Bureau of Statistics, the imports of pig iron during 1933 amounted to 2459 tons, a decline of over 48 per cent from the 4753 tons brought in during 1932. Exports were recorded at 11,903 tons, as compared with 2029 tons in the previous year. The stocks of pig iron held by producers at the end of 1933 totaled 109,507 tons, which compared favorably with the 1932 carryover of 117,460 tons. For the production of pig iron in 1933, Canadian producers imported about 400,290 tons of ore.

The operating rate of the steel industry for the week beginning March 26 was 45.7 per cent as compared with 46.8 per cent last week, according to the American Iron and Steel Institute.

▲ ▲ ▲ Congratulations,Mr. President! ▼ ▼ ▼



Harris & Ewing

AMERICANS in all walks of life have had a heavy load of apprehension removed from their shoulders through your masterly handling of the difficult Detroit situation.

Your interpretation of Section 7a of NIRA, in connection with your settlement of this controversy, is so clear and so fair-minded that it will automatically prevent the recurrence, in this or other industries, of the serious threat to recovery involved in large-scale conflict between employers and employed.

The procedure that you outline as means of carrying out this interpretation are simple, just and as applicable in the steel and metal-working industries as in the automotive and all others.

Especially reassuring to industry as well as to the large body of independent labor in this country are the following principles which you have enunciated:

"1. The employers agree to bargain collectively with the freely chosen representatives of groups and not to discriminate in any way against any employee on the ground of his union labor affiliations."

* * *

"2. If there be more than one group each bargaining committee shall have total membership pro rata to the number of men each member represents."

"4. The Government makes it clear that it favors no particular union or particular form of employee organization or representation. The Government's only duty is to secure absolute and uninfluenced freedom of choice without coercion, restraint or intimidation from any source."

* * *

"INDUSTRY'S obligations are clearly set forth and its responsibilities are established. It is not too much to expect organizations of employees to observe the same ethical and moral responsibilities even though they are not specifically prescribed by the statute."

* * *

YOUR unmistakable protection of minorities of whatever kind, involved in principle number 2, above, brings inspiring reassurance to those who have feared the abolition of minority right of employee groups.

Your unequivocal statement in principle number four removes at once the mistaken impression that employee representation will not be given a square deal in the New Deal and that American industry faces the un-American "closed shop" through Government influence and intervention.

Again we congratulate you, Mr. President, and we congratulate the American public which will benefit from your courageous action.

The Steel Code vs. Industrial Chaos

Federal Trade Commission's Attack Is Leveled Principally Against Privileges Granted By NRA—Current Selling Methods Believed To Be Justified

By T. H. GERKEN

News Editor, THE IRON AGE

CAREFUL study of the Federal Trade Commission's report on the operations of the iron and steel industry's code of fair competition, prepared in response to the so-called Borah resolution, reveals an almost complete lack of recognition of the purposes and implications of the National Industrial Recovery Act. Under the circumstances, the report should probably be considered first as an attack upon the National Recovery Administration rather than upon the steel industry itself which is operating under a code which apparently complies in every respect with the provisions of the recovery act. At least this code has twice been approved by those responsible for the administration of the act. Wherein the report condemns specifically the business practices of the industry, it reverts to criticism which has been heard frequently in the last two decades and which the leaders of the industry have long believed to indicate a lack of understanding of the basic problems involved.

Code Promotes Purposes of Recovery Act

Any unbiased observer will concede that the steps taken by the steel industry under its code were dictated by a desire to carry out the main purposes of the recovery act, namely, to eliminate chaotic price competition so that higher wages and wider employment could be made possible. The elaborate system of open prices worked out under the code does not bar competition, but it does, in large measure, prevent secret price chiseling, a practice which, in times of slack demand, is demoralizing in the extreme and effectively bars profitable operations. The law makes it clear that this type of competition is "unfair." In Section 4 (b) the President is empowered to license an industry whenever he finds that

"destructive wage or price cutting" is being practiced. In Section 5 it is specifically stated that any action complying with the provisions of a code is exempt from the provisions of the anti-trust laws. In Section 3, however, it is stated that no code may promote monopoly or oppress small enterprises. This clause, however, carries a proviso to the effect that the President, as a condition of his approval of a code, may impose conditions for the protection of competitors, as well as consumers, employees and others.

Class b of Section 3, however, is somewhat confusing. While it labels any code violation as "an unfair method of competition in commerce within the meaning of the Federal Trade Commission act, as amended," it adds that nothing in the recovery statute shall be construed "to impair the powers of the Federal Trade Commission under such act, as amended" (The Federal Trade Commission act).

* * *

Price Increases Insignificant

Senate Resolution No. 166 which authorized the Federal Trade Commission's investigation was two-fold. It not only asked for a report on the practice of the steel industry under the code with reference to price fixing, but also for information on the resultant increase in steel prices. It is perhaps significant that more than four-fifths of the formal report is devoted to the operation of the code, while the remaining material referring specifically to price increases is highly inconclusive and obviously based upon insufficient information. Certain phases of this angle of the report are dealt with elsewhere in this issue.

In considering the alleged sins of the iron and steel industry, the commission works on the assumption that further decentralization is both de-

sirable and necessary. Many of its objections are based on this theory. Further opposition is expressed with respect to the basing point system, the method of quoting delivered prices and to the open-price policy. Out of the latter has grown the charge of monopoly and oppression of both the small producer and the small consumer. The commission has also seen fit to regard the code as an unalterable plan of operation even though it has been subject to constant amendment in the form of commercial regulations and resolutions which have corrected many of its original inequalities. The report even goes so far as to admit that many of the practices to which it objects are even now being studied by the various committees of the American Iron and Steel Institute with a view toward subsequent corrective action. The industry itself is very anxious to improve the code by means of thorough investigation and research, and if it is reopened for revision at the end of the present period of application, many changes are certain to result.

Small Members Have Influence

As might have been expected, the Commission was quick to charge the code with domination by the large interests. With the information on this subject readily available, it was patently absurd to make the assumption that the votes of members of the code are allocated according to steel producing capacity. Although the United States Steel Corp. and the Bethlehem Steel Corp. account for 53 per cent of the industry's steel ingot capacity, voting power under the code is determined by 1932 domestic sales of iron and steel products and these two companies are thus entitled to less than 40 per cent of the voting power. Each member is entitled to at least one vote and the smaller producers, there being more

than 240 members of the code, naturally carry considerable weight in the voting. Although the votes of the five or six largest members of the code might carry a majority, it is difficult to imagine these companies in agreement on major policies. Competition has been by no means stifled in the industry and the larger companies are particularly zealous in guarding the trade advantages over one another which they naturally possess. In actual practice, the code has probably worked to the advantage of many small makers of iron and steel products as their immediate articulate responses to the commission reports have indicated. However, it is certain that the small members of the code will have an opportunity to speak for themselves regarding their experiences under it. The commission naturally devoted more attention to the sad plight of the small consumer who has presumably been inarticulate up to the present time.

Jobbers Penalized?

The plight of the jobber is given much attention. Before considering

his case on its own merits, it might be well to point out that finished steel distribution through this medium never exceeds 15 per cent of total shipments during any year. Is the steel industry to be operated for the benefit of the buyers of that 15 per cent of its output? The practical operation of any business probably offers a rather definite answer. The steel industry has always been operated as a tonnage business. Would the commission relegate it to retail trade? As a matter of actual fact, the code effectively prevents steel manufacturers from indulging in what amounts to a jobbing business and thus protects the jobber from what he has always regarded as his most potent competition—the direct selling of mills. The majority of the jobbing trade is highly pleased with this arrangement.

The commission's statement that distributors must sign agreements to conform with specified resale prices is in error. Jobber agreements specify only that distributors must agree not to sell at more favorable prices than mills might be allowed to sell

at under the code. Technically, there is no upper limit on what a jobber may charge for his product. He can get as much as the traffic will bear, but he cannot undersell his competitor. He is thus protected on two fronts. In recent years the steel warehouse business has been highly demoralized by ruthless competitive practices which the iron and steel code has effectively checked. Its status as a vital and necessary industry has been reaffirmed. Should a small minority be allowed to recommend a return to chaos?

What of the Small Manufacturer?

The small manufacturing consumer of iron and steel has found little to complain of under the code. For the first time he has been placed on the same price basis as his large competitor. The large users of steel have done most of the complaining. The Federal Trade Commission, of course, is not concerned with their troubles. Commercial Resolution No. 13 which provides for deductions of \$3 to \$5 a ton in the base prices of certain products sold in lower Michigan is dis-

Small Producers Defend Steel Code—Wire Protests Against FTC Report

PROTEST against the Federal Trade Commission's report which attacked the iron and steel code as oppressing small industry and creating a monopoly has poured into Washington by telegraph from small producers in the steel industry in many parts of the country. Scores of producers and consumers of iron and steel wired their congressmen and senators, Deputy Administrator Kenneth Simpson of the steel code and the Federal Trade Commission denying the charges in the Commission's report.

T. E. Kilby, former Governor of Alabama and now president of the Kilby Car & Foundry Co., Anniston, Ala., declared that the steel code had actually been of great benefit to small producers. Describing his company as probably the smallest of all members of the steel code, he stated that the code has not oppressed or eliminated it, but on the contrary has encouraged and helped it. His statement follows:

The code has not created a monopoly, but it has given the small producer a chance to compete on an even basis with large producers. The latter have always shown a fair and liberal attitude toward small producers. Since the adoption of code our business has been fairly well stabilized, employing more labor at better rates without unreasonable advance of price conditions that would be utterly impossible under unregulated cut-throat competition that existed before adoption of code.

John P. Hosack, vice-president and treasurer, Mahon-

ing Valley Steel Co., of Niles, Ohio, non-integrated sheet maker, wired Senator Borah as follows:

As one of the smaller manufacturers operating under the steel code we feel that results to date prove the steel code has been of great help to small industry. It has eliminated many unfair practices and saved small manufacturers who were being driven out of business. I feel you do not understand conditions and that the steel code should be left alone.

Edward L. Parker, president, Columbia Steel & Shafting Co., Carnegie, Pa., said:

The report of the Federal Trade Commission indicating or alleging that small manufacturers are oppressed by the operation of the code of fair competition for the iron and steel industry is incorrect and unwarranted by the facts. We are a comparatively small manufacturer in the steel industry and our status has been greatly improved by the protection afforded us under the steel code as we are now in a position to compete on a basis of absolute equality with larger producers. The code's provisions are neither unfair nor discriminatory as regards small manufacturers, and as a member of the code we have been greatly benefited by its operation. To return to the former destructive competitive conditions would ultimately result in the elimination of many companies now engaged in small operations.

missed as a concession to the large automotive buyers. The General Motors, Chrysler and Ford companies are not the only buyers of steel in that territory. Hundreds of small users benefited similarly.

Open Price System Condemned

General condemnation of the open price system under which the iron and steel code, along with many others, is now operated cannot be dismissed lightly. Although long recognized as an effective method of curbing ruthless price competition, the policy dates its honorable existence to the advent of the NRA. At that time it seemed the only way to avert chaos in many of the country's basic industries because of underconsumption of their products. The exponents and critics of the system are at opposite poles in the world of economic philosophy. It will probably remain for the courts to decide the result. Certainly it would seem that industrial maturity in the United States demands certain restraining influences for the law of supply and demand if large-scale manufacturing operations are to remain permanently profitable.

In citing instances of price fixing under the code, the commission has done some of its best detective work. It is easy to conclude that all prices are decided collusively and that the large interests have forced their small competitors to go along. In actual practice, it has not been so simple. In a number of instances the price filings of the majority have not been followed by all producers even though the institute provides for the notification of all code members. If a price advance had been contemplated, it had to be abandoned, with all quotations again reverting to the minimum filing. The code cannot prevent such action on the part of individual members and the pressure which can be exerted is highly overestimated. It is true that the offending mill can be forced to reveal its costs and if its proposed selling price is below them, it can be forced to withdraw such a quotation. This procedure, however, is entirely in keeping with the letter and spirit of the National Industrial Recovery Act. It is not likely that the management of any company would care to have its stockholders know that it had deliberately chosen to sell its product at a loss and the chances are remote that action would be taken against any seller who chose to file a price below those filed by his competitors. The latter would be much more likely to meet it. Generally speaking it is safe to assume that the open price system will not stifle the law of supply and demand. Steel prices will not cease to fluctuate, nor will the low cost producer lose his bargaining position with his customer. It has already been discovered that a large buyer is highly appreciative of the sudden filing of a price below the general level and thoroughly ap-

proves of such action. When he gets ready to place his business the co-operative mill usually reaps its reward. The code has not entirely reformed the steel industry.

Basing Points Numerous

In generally condemning the basing point system of selling iron and steel products the commission found itself on familiar ground in view of its activity in the so-called Pittsburgh Plus case and decision which occurred in 1924. This case was directed only against the United States Steel Corp., but the present report serves to apply the objections to the entire steel industry. Here again there seems to be basic difference in economic opinion. It would be easy to point out the injustice of selling all steel products on a single base and charging consumers the freight rate from this base regardless of the origin of their steel. But the code has gone a long way in the correction of such a policy. The fact that it has not gone the entire distance and provided for the sale of iron and steel products on a strictly f.o.b. mill basis is not difficult to understand in view of the efforts made by the code to establish a degree of uniformity in selling procedure and thus advance the cause of fair competition. Theoretically, the practice of selling strictly on a mill basis has much to recommend it, but full application of the principle would lead to chaotic price conditions. If the industry is to be allowed to maintain any semblance of stability and order in competitive practices, the basing point system must remain in some form or other and the practice of quoting all rail delivered prices must also be continued.

With 59 basing points already provided by the code, it would seem that a mill base system had been practically achieved. However, many of them are bases for one product only and certain glaring exceptions are easily brought to light. The code immediately points out that Pittsburgh is a base for sheets while Youngstown, "the largest producer" is not a base. It is not true, as the commission says, that no sheets are made at Pittsburgh. At least one active mill is located there, while Youngstown has only two active units. It is true that the Youngstown producing district is a very large sheet-making center, but so is the Pittsburgh district. In an area within a 75-mile radius of Youngstown are at least 30 towns in which sheets are produced and which might all be basing points. The same statement might be made with reference to Pittsburgh and many of the basing points would naturally be duplicated. If Youngstown were to be a basing point for sheets, why not also Warren, Niles, Mansfield, Newtown Falls and Cambridge, Ohio; Weirton and Chester, W. Va.; Apollo, Vandergrift and New Kensington, Pa., and

many other places? It is well known that the flat-rolled steel industry is widely decentralized. Perhaps a few more basing points would be desirable. The request of Youngstown district consumers and producers that Youngstown be made a base has been and is being given careful consideration.

As opposed to the situation in flat-rolled products, it might be pointed out that all the major producing centers for structural shapes are basing points for shapes. This is true of many other products. It is safe to say that 75 per cent of the capacity for producing steel products is located at basing points or in basing point districts for such products. The establishment of a few more basing points would raise this percentage considerably and it is not unlikely that the administrators of the code will see fit to take such action in the near future.

Why Delivered Prices Are On a Rail Basis

Objections to the quotation of delivered prices based on the prevailing mill quotation plus the all-rail freight charge to the destination have generally come from those interested in truck or water transportation. The subject is a complex one. Obviously rail rates are used as a basis for calculating delivered prices because of their regulation by the ICC and consequent uniformity. Truck and barge transportation are unregulated and the rates widely variable. But the code authority has sought to correct the inequalities arising from the arbitrary fixing of delivered prices by means of exceptions. At least 10 commercial resolutions have been added to the code which provide for deductions from the all-rail delivery charges if delivery is to be made by truck, boat or barge. More are certain to follow. Such resolutions require careful study because of the conflicting interests involved.

The 10 largest producers of iron and steel products in the United States all operate one or more plants located on a river, lake or ocean. At the same time, most of them maintain inland operations not accessible to water transportation. Unrestricted quotation of water rates would naturally penalize inland plants. On the other hand, the present system works to the detriment of plants accessible to water. Some sort of compromise is necessary if the interests of all concerned are to be considered. It might also be mentioned that most of the so-called smaller members of the code operate inland plants. The existing system has served to protect them.

The commission's attitude on the limitation of new producing capacity in the steel industry is possibly the most startling revelation in a report which is apparently designed to be

startling. It seems to be prompted by the urge for further decentralization which underlies the commission's entire philosophy. The inference seems to be that the industry should build more capacity in order to increase competition and eventually put much of the present capacity out of business. The loss to security holders and economic waste involved in such a procedure are not even considered. Another thing which has not been considered is the heavy initial expenditure required for the building of blast furnace or steel-making capacity. It is rather evident that it would be exceedingly difficult to attract the required capital for investment in an industry which would be regulated in the manner which the Federal Trade Commission suggests for the iron and steel industry.

The idea that much of the steel-making equipment of the industry is at present obsolete is also rather far-fetched. Large sums are spent yearly for replacement and modernization and the code does not prevent the rebuilding of existing facilities. Even today much money is being spent to lower costs by the replacement of obsolete equipment. It is not necessary to build new plants in order to raise the general efficiency level of the industry.

Limitation of new blast furnace and steel-producing capacity also does not conflict with the commission's plan of decentralization. Rolling mill facilities may still be built and steel in semi-finished form may be moved about the country much more economically than can the coal, ore, limestone and other raw materials which go into the production of steel. If there must be decentralization, let it be accomplished by the addition of new rolling mills rather than steel-making plants.

Employee Representation Wins at Columbia Plant

SAN FRANCISCO, March 26. — A victory for the United States Steel Corp'n's "employee representation" plan was scored when employees of the Columbia Steel Co. plant at Pittsburgh, Cal., voted better than two to one in favor of continuance of the corporation's works council. It is reported that strenuous efforts were made by the Amalgamated Association of Iron, Steel and Tin Workers to unionize the Pittsburgh plant, which is the largest producing center on the Coast.

Consumers in India are inquiring for wrought iron, galvanized and black pipe. Further information can be secured from the Department of Commerce, referring to T.O. No. 7246.

British Steel Demand Sustained—China and Russia Place Orders

LONDON, March 26 (By Cable).—British pig iron is strong, and production is being taken up promptly. Cleveland iron is scarce, and hematite is heavily sold.

Makers of semi-finished steel are well booked. Offers of foreign semi-finished now are less attractive. Demand for finished steel is improving, particularly structural shapes for building, while rail and plate mills are less active. Shortage of export orders for sheets is causing anxiety. Russia has ordered 20,000 tons of pipe with an option to purchase further quantities, and China has taken 17,000 tons of rails.

New business in tin plate is quiet despite inquiries for home and export consumption. Continental competition is increasing.

Continental iron and steel markets are more quiet. The United States has placed orders for reinforcing bars. Russia has placed 19,500 tons of plates and joists and an additional 5000 tons is expected. The International Raw Steel Cartel has raised the ex-

port tonnage quota for second quarter by 25,000 tons to 525,000 tons. The joists office has decided to maintain prices until the broad-flanged joist cartel is firmly established. The International Wire Export Co. has left prices unaltered and complained of American and Japanese competition.

Industrial Progress At Cleveland Show

PROGRESS made in the development of machines and parts during the last year will be reflected in the Industrial Progress Show to be held in the Hanna Building, Cleveland, under the sponsorship of the Cleveland Engineering Society, April 11 to 14. Speakers at the meetings which will be held in conjunction with the show will be T. J. Maloney, New Jersey Zinc Co., New York, and Forrest U. Webster, Cutler-Hammer Co., Milwaukee, who will discuss the development and redevelopment of the product and the development of the market for the product.

The show will include transmissions, motors, regulators, bearings, controllers, meters, die castings, metals, grinders and other interesting machines and products. Wherever practical, the machines to be displayed will be in actual operation with the method of securing the best results with their use fully demonstrated. Experimental models and recently patented devices will be included in a separate division of the show. Scientific demonstrations, as proofs of everyday scientific facts will be given.

Two Sheffield Stacks To Be Scrapped

THE Max Solomon Co., Pittsburgh, has purchased for dismantling the No. 5 and No. 6 blast furnaces at Sheffield, Ala., from the Sloss-Sheffield Steel & Iron Co., Birmingham. These furnaces, which were abandoned on Dec. 31, 1929, will probably be scrapped and shipped by barge via the Tennessee River to Paducah, Ky., and thence to Ohio River consuming points. Another possible disposition may be for export. About 10,000 to 12,000 tons of No. 1 heavy melting steel and cast iron scrap is expected to be realized from these furnaces. The original No. 5 furnace is believed to have been one of the oldest stacks in the South, and was constructed for making cannon balls for the Confederate Army.

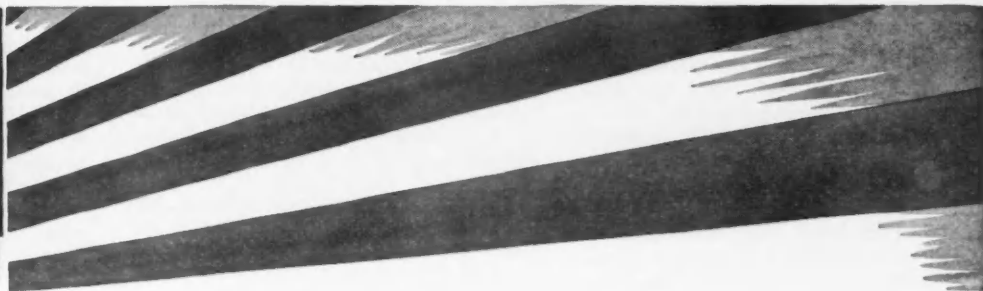
British Prices, f.o.b. United Kingdom Ports

Per Gross Ton			
Ferromanganese, export	£9		
Billets, open-hrth.	£5 10s.	to	£5 12s. 6d.
Tin plate, per base box	16s. 3d.	to	16s. 9d.
Steel bars, open-hearth	£7 17½s.	to	£8 7½s.
Beams, open-hrth.	£7 7½s.	to	£7 17½s.
Channels, open-hearth	£7 12½s.	to	£8 2½s.
Angles, open-hearth	£7 7½s.	to	£7 17½s.
Black sheets, No. 24 gage	£9 5s.		
Galvanized sheets, No. 24 gage	£11 5s.	to	£11 15s.

Continental Prices, f.o.b. Continental Ports

Per Metric Ton, Gold £	
Current dollar equivalent is ascertained by multiplying gold pound price by 124.14 to obtain franc equivalent and then converting at present rate of dollar-franc exchange.	
*Ingots	£2 5s.
*Billets, Thomas	£2 7s.
Wire rods, No. 5 B.W.G.	£4 10s.
*Steel bars, merchant	£3 2s. 6d.
*Sheet bars	£2 8s.
Plates, ½ in. and up	£4 1s. 6d.
*Plates, 3/16 in. and 5 mm.	£4 3s. 6d.
*Sheets, ½ in.	£4 8s. 6d.
*Ship plates	£4 10s.
*Beams, Thomas	£2 19s.
*Angles (Basic)	£3 2s. 6d.
Hoops and strip steel over 6-in. base	£4
Wire, plain, No. 8	£5 7s. 6d.
Wire nails	£5 15s.
Wire, barbed, 4-pt. No. 10 B.W.G.	£5 15s.

*Prices as established by European Raw Steel Cartel.



THIS WEEK IN WASHINGTON

Steel Industry Is Widely Attacked

*Labor's Continued Fire Is Joined By Federal Trade Commission
Report—Automotive Industry's Difficulties May Soon
Be Repeated In Steel Group*

WASHINGTON, March 27. — The iron and steel industry was the brunt of attacks on all fronts during the past week. The threatened automotive strike gave evidence to the belief that the two outstanding open shop industries of the country were the victims of a prearranged campaign by organized labor to enforce union recognition.

The iron and steel industry, however, was assailed on a much wider front. The major developments were as follows:

The Federal Trade Commission published a report attacking the steel code.

The Department of Justice filed suit against the Weirton Steel Co., endeavoring to compel it to assent to an election under National Labor Board supervision demanded by the Amalgamated Association of Iron, Steel and Tin Workers.

William Long, member of the association, employed by the Weirton Steel Co., told the Senate committee on education and labor that there will be a general steel strike unless Congress passes the Wagner bill.

Long and a delegation of union members called at White House, Department of Justice and the NRA, seeking immediate action against the Weirton company and asked Compliance Director W. H. Davis to deprive the company of its Blue Eagle.

By **L. W. MOFFETT**
Resident Washington Editor
THE IRON AGE

Senator Borah delivered a speech in the Senate based upon FTC report, urging complete redrafting of steel code and full restoration of anti-trust laws.

Reports from Administration sources intimated that something would be done regarding the open-price policy of the steel code.

A delegation of workers from the Duquesne, Pa., works of the Carnegie Steel Co. petitioned Senator Wagner, as chairman of National Labor Board, to conduct an election under board's supervision.

FTC Report Far-Reaching

Implications of the report of the Federal Trade Commission on the iron and steel code are far-reaching. They go beyond the possible effect on the steel industry and strike at the foundation of the NRA. Without giving undue weight to the commission's report and despite criticism that may be made of it, it comes at a time when there is a rising protest against open price policies sanctioned in NRA codes. The commission stoutly supported this movement and made a sweeping indictment of the entire steel code. In doing this, it was not simply

attacking the steel industry, but the NRA itself. It made lively use of the Borah resolution to investigate the steel code in order that it might air a family quarrel. This was in return for the blistering assault made on the commission by General Johnson in his address at New York on Jan. 18 before the National Retail Dry Goods Association.

Hostility Now Articulate

Hostility has existed between the two Governmental bodies since the commission began to busy itself with the steel code. The commission strongly resented loss of its standing as disciplinarian to industry. It was particularly irritated that the NRA steel code took jurisdiction over practices with which the commission had long concerned itself, notably those surrounding the Pittsburgh-plus case. The commission, apparently upon its own volition, made a report some time ago having to do with the industry's operations under the code. The report went to the White House, it is understood, but nothing further is known about it. It was evident at that time that the NRA was considerably annoyed at this meddling of the commission and just as the commission looks upon the NRA as an interloper, so the NRA felt that the commission was a trespasser on the NRA's precincts.

When Senator Borah, champion of the "oppressed" small enterprise and antagonist of "monopoly," introduced his resolution it was manna for the commission and wormwood for the

NRA. It will be recalled that Senators Borah and Nye had previously had a difference with General Johnson over charges by the Senators that codes were oppressing small enterprises. It is quite likely that General Johnson's scornful treatment of the Senators' complaint had a great deal to do with the pressing of the issue as reflected in the steel code inquiry and as proposed for other major codes. Certain it is that the commission's slashing report on the steel code took a sweeping range and was drawn up as a far-flung attack on principles which underlie the NRA and have been the object of wrath both in and out of Congress.

Borah Quick To Act

Senator Borah was quick to grasp the anticipated purport of the commission's attack on the steel code. The day after it was made public the Idaho Senator issued a blast against the NRA for promoting "monopolistic prices and control in industry" and announced he would press his bill for full restoration of the anti-trust laws. He proceeded to say that conditions revealed in the commission's report are "undermining, embarrassing, sapping the entire recovery program." He did not have in mind the steel industry code alone, but was referring to the entire NRA policy.

"Of course, this would not be true if the steel industry alone were engaged in these practices," said Senator Borah, "but there are a number of leading industries, practically all, which, I venture to say from investigations which I have made myself, if resolutions should be introduced, would be found to be engaged in the same practices precisely as those followed by the steel industry."

It is then clear that it was not planned to make the steel industry the only "bad boy" in the code family. The commission and the Senator proposed to show that there are many such boys and that the NRA is responsible for their alleged misconduct and should be chastised more than the bad boys themselves. It is intended to use the steel code report simply as the opener for a general attack on many other codes of both major and minor industries in the hope that there will be a shake-up in the entire NRA such as to compel it to forego all price plans, and many other practices, including the much-discussed basing point system. To such an extent would be the shake-up that industry no longer would be interested in having codes.

Senator Borah, however, when asked by Senator Fess of Ohio as to what would be left of the NRA if the Borah anti-trust bill were passed, said that in his opinion restoration of the anti-trust laws would in no wise conflict with "the fair execution of the recovery act." He insisted that decisions of the courts establish beyond all question that the coming together of in-

dustries for the purpose of maintaining fair competition is not prohibited by the anti-trust laws. The Senator declared that "it is where they engage in an effort to practice unfair competition, to destroy competition, that the anti-trust laws may be invoked."

Price Policies In Codes To Be Revised?

But the Senator is strongly opposed to price policies incorporated in codes despite the contention of their proponents that they prevail only to the extent of preventing chiseling and unfair competition. In view of the study of the question within the NRA itself for the purpose of establishing new price policies, such as the recently adopted plan for prices to become effective immediately upon filing with code authorities, it is conceivable that there will be some important changes made in the near future. They may be considerably more restrictive than present policies. There is a difference within the NRA over the issue and, whether true or not, it is reported that this difference was partially responsible for the resignation of Divisional Administrator A. D. Whiteside from the NRA.

The prospect of revision of codes is heightened also by the report that President Roosevelt himself feels that the commission report on the steel code showed an unsatisfactory condition as to alleged price-fixing, although that it failed to show collusion. He is said to be of the conviction that something will have to be done to change the present plan. But if action is taken with regard to the Steel Code as it relates to price policy it will also have to be taken with regard to some 300 codes which contain a similar price policy.

Steel Leaders in Washington

Because of the reaction to the steel code report the industry apparently is making an effort to clear up the situation. This is believed to be the reason for the visit here last Friday of prominent members of the steel industry and of the American Iron and Steel Institute, the industry's code authority. They called upon General Johnson and Divisional Administrator K. M. Simpson and are said to have discussed the commission's report prior to the preparation of data to dispute the points made by the commission. Included in the delegation were W. A. Irvin, president, United States Steel Corp.; Eugene G. Grace, president, Bethlehem Steel Co.; T. M. Girdler, chairman and president, Republic Steel Corp.; L. E. Block, chairman, Inland Steel Co.; W. J. Filbert, chairman finance committee, United States Steel Corp.; H. A. Moore, counsel for the institute, and Walter S. Tower, executive secretary of latter group.

It is said that material supplied in answer to the commission report will be laid before the President. It is believed that the attacks against the

basing point system, the filing of prices, charges for extras, transportation arrangements and other factors at which the commission directed its fire will all be dealt with. The President is said to be interested especially in the cost of producing steel rails and to feel that they should be disclosed. It is reported that while formerly he felt satisfied with the agreement he made with rail producers on prices for rails last fall, he now is inclined to the opinion that they are still too high. This question of course is only indirectly connected with the commission's steel code report but has been brought to light again because of the report.

Small Units Defend Code

The outstanding reaction to the steel code report was the challenge to claims that the code oppresses small enterprises. Immediately after the report was published telegrams from small steel concerns were directed to members of Congress and the NRA vigorously upholding the code as their salvation. Some of the telegrams bitterly assailed "demagogic" attacks on the code by politicians and others. These concerns made it quite clear that the "big monopolies" were not using the code to oppress them. Quite the contrary. The report, of course, did not claim that the "oppression" rested against small units within the industry alone, but that small consuming interests were greatly injured by the basing point system and other practices. But the commission found that any drive to change the code greatly perhaps would be as strongly if not more strongly resisted by small steel concerns than by the larger ones.

Commission Has Done Nothing in Past

There is clearly one criticism of the commission itself for its ready-made condemnation of the NRA, which is readily apparent in the steel code report. The commission complains extensively about the basing point system. It is almost an obsession. Yet the commission, itself the crusading source which investigated the basing point system and in 1924 ordered abolition of the Pittsburgh-plus plan, had almost exactly nine years in which to straighten out the system which it affects to think is still pernicious. It appears to be a sad commentary on the commission's own authority that these nine years passed by without any further action and that when the NRA came into being it can immediately be attacked for allowing such a system to prevail. Obviously the NRA may not have the least desire to do away with the system. Apparently it does not at all share the view of the commission as to the alleged defects of the basing point system. But even if it did it hardly would be subject to blame for not doing within less than a year

what the commission has failed to do in nine years.

Finally, it is only fair to the NRA to say that the steel code is always under observation by its two representatives, Administrator Simpson and General Counsel Donald Richberg. Provision for such observation is made in the code itself and no doubt their observations have been responsible for some revisions in code operations and will bring about others as problems arise.

Weirton Case Being Watched

The Department of Justice suit against the Weirton Steel Co. is looked upon as directed against the entire industry so far as the ultimate effect is concerned. The industry as a whole stands with the Weirton company against organized labor recognition. The Department is seeking quick action on its demands, one of which is to compel the company to file with the Federal Court in Wilmington, Del., its payroll list and records necessary to holding an election. The move portends an early court test of the collective bargaining section of the National Industrial Recovery Act.

Mr. Long, heading a delegation of seven workers, spent busy days in Washington airing what he termed grievances against the steel industry generally and the Weirton company in particular. His declaration before the Senate committee on education and labor that a general steel strike will be called unless the Wagner bill is passed came as a surprise. He was attempting to offset testimony opposing the bill which he understood was to be presented later before the committee by E. T. Weir and other steel officials. Similar threats have been made before the Senate committee by organized labor leaders in other industries.

Curt Demand to President

At the White House, Long left with Marvin H. McIntire, a secretary to the President, a tart statement addressed to the Chief Executive. The amazingly curt tone of this document, speaking directly to the President of the United States, has few parallels. Protesting that the Department of Justice action was not drastic enough, because "it does not force Weir to deal with our union," the delegation in its statement said: "We call upon you to get Weir to comply with the NRA within 48 hours, or get the Wagner bill passed this week, or else stop pretending that any immediate and effective action by the Government is possible." The President disregarded the ultimatum.

The delegation was sent to see Attorney General Cummings and emerged after a half hour conference. It was mollified. Mr. Long said that "satisfactory action now is being taken." The delegation also called upon W. H. Davis, national compliance director, to withdraw the Blue

Eagle from the Weirton company. Then it turned to Federal Relief Administrator Hopkins seeking relief funds for the families of 500 Weirton workers who have been "victimized" by the collective bargaining section of the recovery act. The delegation finally conferred with William Green, president of the American Federation of Labor.

Election Asked at Duquesne

William J. Spang, representing the Fort Duquesne Lodge of the Amalgamated Association of Iron, Steel and Tin Workers, headed the delegation which petitioned Senator Wagner for a Labor Board-supervised election at the Duquesne plant of the Carnegie company. Request was made that the election be held off company property to determine "the choice of a local company union or a local branch of a union affiliated with the American Federation of Labor." The petition was signed by 1500 of the 4000 employees, according to an NRA announcement, which said the delegation professed a willingness to obtain more signatures if the board did not deem this a "substantial number." The petition was accompanied by a protest against the conduct of an election held Feb. 23 under the Carnegie employee representation plan and made the usual charges of coercion, etc.

This petition marked widening of the activities of the association within the steel industry and was looked upon as further intensification of the move to compel recognition of organized labor.

Meanwhile, the "election" ordered by General Johnson for the Budd Mfg. Co. employees in Philadelphia was a fracas. Union employees refused to go to the polls because the order permitted voting by workers who took the place of strikers last fall, though these strikers also were given the right to vote. Apparently the NRA proposes that the election shall stand with the result that the employee representation plan will be continued. The Budd company agreed to the election and complied in every way with its terms.

National Labor Board Reverses Detroit Opinion

Partially reversing a decision of the Detroit Regional Labor Board, the National Labor Board has held that the discharge by the Great Lakes Steel Corp. of two employees, George Hynes and George Richards, violated Section 7a of the recovery act, and directed that the company reinstate them immediately. It also recommended that the company place two other former employees, William Ferguson and George Russell, on a preferential list for reemployment. All four members belonged to the Amalgamated Association of Iron, Steel and Tin Workers. The Detroit board

had ruled that the discharge of the four men did not violate Section 7a.

Case Strike Settled

Settlement of the strike at the plant of the J. I. Case Co., Racine, Wis., based on recognition of a new independent organization called the Racine Workers' Committee, a 15 per cent wage increase and a 45c. per hr. minimum pay rate has been reported to the National Labor Board.

Consumers' Group Opposes Political Nostrums

Hope of the NRA that the consumers' goods group would absorb a large share of the unemployment has been given a blow by the statement of the Consumers' Industries Committee, headed by George A. Sloan, New York, chairman of the cotton textile code authority. The committee said that industries represented had nearly approached the limit of their capacity to absorb unemployed. It declared that the principal burden of reemployment lies with the capital goods industries. Except that it merely reiterated what industry has been repeatedly stating, the highlight of the committee statement was its criticism of political and legislative nostrums. The committee urged the doing away with "political obstacles and legislative threats." To do this, it was stated, would bring new capital to the capital goods industries necessary for recovery. The committee directed its fire at the Wagner and Connery labor bills and the stock exchange bill.

March Construction Awards Increasing

CONTRACTS awarded for all classes of construction in the 37 States east of the Rockies during the first half of March reached a total within 4 per cent of the volume reported during the entire month of February, according to figures of F. W. Dodge Corp. Construction awards in the first 15 days of March, totaling \$92,521,800, were larger by 55 per cent than the total reported for the entire month of March, 1933. Although the increases over last year were due chiefly to larger Governmental undertakings, the Dodge bulletin indicates a moderate gain in privately-financed construction projects as well.

February awards for construction of all descriptions in the 37 Eastern States totaled \$96,716,300 as against \$186,463,700 for January and \$52,712,300 for February, 1933. February awards were 83 per cent larger than those registered in February, 1933.

President's Strike Settlement Means Revision of Wagner Bill

WASHINGTON, March 27.—With both automobile manufacturers and officials of the American Federation of Labor expressing satisfaction at the settlement of their controversy by President Roosevelt, a distinctly new relationship between labor and industry has been set up. Carried out in the spirit in which they are so clearly outlined by the President, the principles of his policy should bring to an end the hitherto bitter and prolonged conflicts over Section 7a of the National Recovery Act. They go far beyond averting a strike in the automobile industry, as serious as it would be both to the industry itself and the many industries, including iron and steel, which are so dependent on it for much of their activity. The principles established in the settlement are interpreted as being of such breadth as to lay a well-defined pattern for the settlement of disputes in all other industries, some of which have reached a critical stage. This is especially true of the iron and steel industry.

The principles involved in these disputes all center about Section 7a, the collective bargaining section, of the Recovery Act and though in the iron and steel industry the strike situation has not reached as tense a point as was reached in the automobile industry, it nevertheless is the source of grave concern.

The President's plan has been referred to as a compromise, and while it is probably true it was not entirely satisfactory to either side, it certainly includes points on which the automobile manufacturers had insisted.

That this is so is evident from the brief statement issued by Alvan Macauley as president of the National Automobile Chamber of Commerce.

"We are very grateful to the President and General Johnson that they have been able to find a settlement in accord with the principles for which we have contended," said Mr. Macauley.

President William Green of the American Federation of Labor declared:

"There is no basis for a claim on the part of either side of the controversy, employers or employees, that either has gained a victory over the other."

"Company" Unions Recognized

An outstanding point scored by the manufacturers is seen in equal recog-

nition given company and outside unions. Clearly this is a blow and seems to mean defeat of the Wagner bill which would abolish company unions. It strikes at the NRA policy itself. For the NRA, conflicting as its attitude on the company union has been, has been leaning recently strongly against it. In fairness, however, it is recalled that the NRA has recognized the company union where it was held to be one of selection solely by employees.

The agreement provides that employers in laying off workmen shall do so proportionately as between membership in outside and company unions. The requirement is laid down that unions reveal the names of their members, and this was a point insisted upon by the automobile manufacturers. However, the lists may be made available to employers only by order of the President. The American Federation of Labor had offered to present such lists only to the government.

Automobile manufacturers also had previously agreed to the setting up by the NRA of a board to investigate charges of discrimination against employees who claimed they were discharged because of their union activities. The industry only asked that in bargaining with outside unions their representatives should give their authority to act as such spokesmen. No appeal can be made to the board, consisting of a labor, an industry and a government representative, by an employee who charges discrimination unless his union has listed his name and his employer.

The section covering this point reads as follows:

"In cases where no lists of employees claiming to be represented have been disclosed to the employees claiming to be represented have been disclosed to the employer, there shall be no basis for a claim of discrimination. No such disclosure in a particular case shall be made without specific direction of the President."

Board to Have Union Names

The board is to have access to the names of outside union as well as company union members, and its decisions are to be final. Manifestly, it is seen there will be occasions where the labor and the industry representative will disagree, so that the decisions will often turn upon those made by the government representative. In

consequence a vital element in operation of the board is the attitude of the government representative. Because the government has been held to lean toward organized labor this point has created some misgiving within industry.

The settlement recognizes all groups, outside unions, company unions, and those not affiliated with any group, for purposes of collective bargaining and they are to be given a standing prorated according to their membership. This is in direct contradiction of the attitude of the National Labor Board, particularly as enunciated in the Denver tramway case. In that proceeding, which was intended as precedent, the board held that labor representatives chosen by a majority vote for purposes of collective bargaining could bargain for the entire total of workmen at the affected plant. The President's agreement upsets this policy and permits bargaining by minorities and apparently by individuals as well. This latter policy reflects the position outlined by General Johnson and General Counsel Richberg of the NRA in a joint statement issued sometime ago in connection with a Presidential order growing out of the Weirton Steel Co. case. The Johnson-Richberg statement was issued in order to correct what it stated was a misinterpretation of the President's order which indicated that the company union would not be recognized.

No Appeal from Board

Giving the board both original and final authority also is in conflict with the contention of organized labor which had urged the right of appeal from the original source. Inasmuch as the board is to sit in Detroit it will mean the transfer of the automobile industry's labor problems to that town from Washington. The setting up of the board has created speculation as to whether or not others of a similar character will be established at different points to take up labor problems in other industries. Such a development clearly would mean the taking away of many cases from the National Labor Board with consequent diminution of the importance of the latter. The latter board not only has been frequently challenged as to its authority but also has been attacked by both labor and industry as accomplishing little.

The precise section (4) of the President's agreement which strikes hard

at the American Federation of Labor position, upholds the company union and apparently means the Wagner bill will be either defeated or greatly modified, reads as follows:

"The government makes it clear that it favors no particular union or particular form of employee organization or representation. The government's only duty is to secure absolute and uninfluenced freedom of choice without coercion, restraint or intimidation from any source."

"Works Council" Advocated

Recognition of the company union, so hotly contested by organized labor, clearly is granted by this provision. The President made it clear what he had in mind when he said "it is my hope that this system may develop into a kind of works council in industry in which all groups of employees, whatever may be their choice of organization or form of representation, may participate in joint conferences with their employers and I am assured by the industry that such is also their goal and wish." He paid tribute to the automobile manufacturers, as well as the labor representatives, for their tireless efforts to settle the strike. These efforts extended over a period of some 10 days in Washington. Conferences were held at the White House and at the NRA but at no time did the manufacturers and labor representatives meet in a joint session. Time after time there were evidences that the conferences would break up in failure and that a strike spread throughout the automobile industry would develop, probably followed by strikes in other industries, both those directly and indirectly related and unrelated to the automobile industry.

Precedences for layoff as covered in the agreement are set forth, with first consideration to "such human relationships as married men with families shall come first and then seniority, individual skill and efficient service." It is then provided that "no greater proportion of outside union employees similarly situated shall be laid off than of other employees." The plan of layoff as it touches upon skill is looked upon as complete support of the much-discussed merit clause in the automobile code which was the object of wrath on the part of organized labor.

The agreement was announced Sunday night from the White House. It was made immediately after a three-hour session the President held with labor leaders and it is said that the President had vigorously insisted that the agreement be accepted. It is reported that the labor leaders had objected to portions of the agreement and this appears to be true. This is supported by the fact that after the manufacturers during the day had conferred with General Johnson the latter was called upon at his office by the labor leaders. Following a long

conference with him, the labor leaders selected five of their members who went to the White House. It was evident there still was some difference between the employers and the labor leaders. General Johnson resumed contact with the manufacturers after stating that "only a word separates them." It was about an hour later that announcement came from the White House that the controversy had been settled. The length of the White

House conference between the President and the labor representatives was taken to mean they were not satisfied with the terms of the agreement. This "word" which General Johnson said was holding up the agreement was indeed a weighty word with weighty meaning for it concerned the question as to whether unions should disclose the identity of their members to the employers. Employers absolutely insisted that their identity be revealed.

Emery Flays Wagner Bill Before Senate Committee

WASHINGTON, March 27.—Asserting that the plain intent of the Wagner "Labor Disputes" bill was intended to permit but one form of labor organization—the national union—and "undertakes to drive all workers into it," James A. Emery, general counsel of the National Association of Manufacturers, told the Senate Education and Labor Committee Monday, March 26, the legislation would "excite irritation, resentment and bitterness in employment relations."

Mr. Emery appeared before the committee as the spokesman of the nation's manufacturers, opening the testimony against the bill upon which proponent testimony has been completed with the support of the American Federation of Labor. He spoke not only for the National Association but for state manufacturers' associations representing the major industrial centers.

Advocating the need of "sympathy, good will and understanding" to promote cordial relationships, Mr. Emery said:

"This bill will stimulate complaint, promote the interruption of employment, and deliberately undertakes by its definitions and operation to force employees into one form of labor organization—the union, it will secure to the union monopolistic control; assure it the unrestricted use of the strike, and thus confer the power to assess the public with the cost of sustaining a labor monopoly, maintained with Federal aid, relieved of appropriate legal control, and without corresponding responsibility for the acts of its agents."

Mr. Emery replied to assertions that during the last few months the conditions of workers had not been improved by quoting the Department of Labor statistics.

Recent Benefits to Labor

"You are asked for new legislation on the ground that labor has not been fairly treated," he told the committee,

"but within nine months more than twenty million employees have received shorter hours, higher pay, better working conditions, with increased expense to every industry, through codes which, under the circumstances of their formulation, have amounted to national legislation through collective agreements between employers and employees with the government."

Pointing out that many systems of collective relationships had been built over many years to promote mutual faith between employers and workers, Mr. Emery said "they would be abrogated by this bill."

"We are not here to defend all employers or condone misconduct," he said. "There are doubtless bad company organizations as there are bad labor unions. We resent the suggestion that normal conduct of the employer shall be outlawed and the abnormal conduct of other groups encouraged. We therefore oppose the measure before you because we believe it invalid in law and unsound in principle."

"It is not an exercise of the commerce power of Congress but a deliberate and indefensible invasion of the right to regulate and even compel the local employment relations which the Supreme Court without exception has declared are an exclusive subject for State and not Federal control."

Penalizes the Employer

"The policy of the measure would not equalize the bargaining power of employers and employees as its title suggests, nor encourage the amicable settlement of disputes between them. On the contrary, analysis shows it to be so designed as to prevent the employer from exercising the natural circumstance of bargaining, impairs its nature and extent, gratuitously presumes that he only exercises coercion in the employment relation, or indulges in unfair practices; makes no effort to define, regulate or prohibit the equally reprehensible and long-recognized practices and abuses

(Continued on Page 63)

Full Text of President's Statement on Auto Situation

AFTER many days of conferring in regard to the principles of employment in the automobile industry the following statement covers the fundamentals:

1. Reduced to plain language Section 7a of N.I.R.A. means—

(a) Employees have the right to organize into a group or groups.

(b) When such group or groups are organized they can choose representatives by free choice and such representatives must be received collectively and thereby seek to straighten out disputes and improve conditions of employment.

(c) Discrimination against employees because of their labor affiliations, or for any other unfair or unjust reason, is barred.

A settlement and statement of procedure and principles is appended hereto.

It has been offered by me to, and has been accepted by, the representatives of the employees and the employers. It lives up to the principles of collective bargaining. I hope and believe that it opens up a chance for a square deal and fair treatment. It gives promise of sound industrial relations. It provides further for a board of three of which the chairman will as a neutral represent the Government.

In actual practice details and machinery will of course have to be worked out on the basis of common sense and justice, but the big point is that this broad purpose can develop with a tribunal which can handle practically every problem in an equitable way.

Principles of Settlement

Settlement of the threatened automobile strike is based on the following principles:

1. The employers agree to bargain collectively with the freely chosen representatives of groups and not to discriminate in any way against any employee on the ground of his union labor affiliations.

2. If there be more than one group each bargaining committee shall have total membership pro rata to the number of men each member represents.

3. NRA to set up within twenty-four hours a board, responsible to the President of the United States, to sit in Detroit to pass on all questions of representation, discharge and discrimination. Decision of the board shall be final and binding on employer and employees. Such a board to have access to all payrolls and to all lists of claimed employee representation and such board will be composed of—

(a) A labor representative, (b) an industry representative, (c) a neutral.

In case where no lists of employees claiming to be represented have been disclosed to the employer, there shall be no basis for a claim of discrimination. No such disclosure in a particular case shall be made without specific direction of the President.

4. The Government makes it clear that it favors no particular union or particular form of employee organization or representation. The Government's only duty is to secure absolute and uninfluenced freedom of choice without coercion, restraint, or intimidation from any source.

5. The industry understands that in reduction or increases of force, such human relationships as married men with families shall come first and then seniority, individual skill and efficient service. After these factors have been considered no greater proportion of outside union employees similarly situated shall be laid off than of other employees. By outside union employees is understood a laid-up member in good standing, or anyone legally obligated to pay up. An appeal shall lie in case of dispute on principles of paragraph 5 to the Board of Three.

In all the hectic experience of NRA I have not seen more earnest and patriotic devotion than has been shown by both employers and employees in the automotive industry. They sat night and day for nearly two weeks without a single faltering or impatience. The result is one of the most encouraging incidents of the recovery program. It is a complete answer to those critics who have asserted that managers and employees cannot cooperate for the public good without domination by selfish interest.

In the settlement there is a framework for a new structure of industrial relations—a new basis of understanding between employers and employees. I would like you to know that in the settlement just reached in the automobile industry we have charted a new course in social engineering in the United States. It is my hope that out of this will come a new realization of the opportunities of capital and labor not only to compose their differences at the conference table and to recognize their respective rights and responsibilities but also to establish a foundation on which they can cooperate in bettering the human relationships involved in any large industrial enterprise.

It is peculiarly fitting that this great step forward should be taken in an industry whose employers and employees have contributed so consistently and so substantially to the industrial and economic development of

this country in the last quarter century. Having pioneered in mechanical invention to a point where the whole world marvels at the perfection and economy of American motor cars and their widespread ownership by our citizens in every walk of life, this industry has indicated now its willingness to undertake a pioneer effort in human engineering on a basis never before attempted.

In the settlement just accomplished, two outstanding advances have been achieved. In the first place, we have set forth a basis on which, for the first time in any large industry, a more comprehensive, a more adequate and a more equitable system of industrial relations may be built than ever before. It is my hope that this system may develop into a kind of works council in industry in which all groups of employees, whatever may be their choice of organization or form of representation, may participate in joint conferences with their employers and I am assured by the industry that such is also their goal and wish.

In the second place, we have for the first time written into an industrial settlement a definite rule for the equitable handling of reductions and increases of forces. It would be ideal if employment in all occupations could be more generally stabilized, but in the absence of that much desired situation, if we can establish a formula which gives weight to the human factors as well as the economic, social and organizational factors in relieving the hardship of seasonal layoff, we shall have accomplished a great deal. My view, and that of both employees and employers, is that we have measurably done so in this settlement.

This is not a one-sided statute and organizations of employees seeking to exercise their representative rights cannot at the same time be unmindful of their responsibilities.

Industry's obligations are clearly set forth and its responsibilities are established. It is not too much to expect organizations of employees to observe the same ethical and moral responsibilities even though they are not specifically prescribed by the statute. Only in this way can industry and its workers go forward with a united front in their assault on depression and gain for both the desired benefits of continually better times.

Ludlum Steel Co. Declares Dividend

DIRECTORS of Ludlum Steel Co. on March 26 declared out of current earnings the regular quarterly dividend of \$1.625 per share on the Company's 6½ per cent preferred stock payable on April 11 to preferred stockholders of record at the close of business on April 7.

Steel Companies Advance Wages Effective April 1

THE action of the Corrigan, McKinney Steel Co. in announcing an advance of 10 per cent in wage rates, effective April 1, has been followed by similar moves on the part of the National Steel Corp., American Rolling Mill Co. and Wheeling Steel Corp.

E. T. Weir, chairman, National Steel Corp., has expressed gratification at the announced intention of other steel companies in the industry to join in the 10 per cent increase on April 1. This advance restores the wage level effective during the boom years, 1926 to 1929, in the steel industry. Weir, who throughout the depression has constantly and stubbornly contested wage reductions on the basis that liquidation of labor was potentially a source of evil rather than good, expressed the conviction that the increase involving 420,000 pay envelopes will give real impetus to other recovery measures. Affirming the intention of the National Steel

Corp. to make this adjustment, he said, "As far as our company is concerned, increased economies in production and much improved operating schedules make this wage increase possible at this time. This adjustment," he continued, "applies to all wage employees of the National Steel Corp.'s steel producing subsidiaries from foremen to unskilled laborers, and affects about 18,000 employees of the Weirton Steel Co. at Weirton and Clarksburg, W. Va., and Steubenville, Ohio, employees of the Great Lakes Steel Corp. at Detroit, and also of the Hanna Furnace Corp.

Weir made it plain that in his opinion the industry would continue operations on the basis of 40 hr. average per week as provided in the code for the iron and steel industry, and that no shortening of hours was being contemplated at this time. He also said that for the present at least the adjustment would not affect the executive, administrative or clerical forces.

Wholesale Prices in February, 1934

WHOLESALE commodity prices showed another substantial gain during February and rose by 2 per cent according to an announcement made today (Saturday) by Commissioner Lubin of the Bureau of Labor Statistics of the U. S. Department of Labor. The index number for the month advanced to 73.6 per cent of the 1926 average as compared with 72.2 per cent for January.

"The continued upward movement in prices," Mr. Lubin stated, "was well scattered throughout the ten major groups of commodities covered by the Bureau. All groups showed advances with the exception of fuel and lighting materials which decreased by 1 per cent. Of the 784 items in the index 218 or more than 25 per cent of the total showed an increase and 478 showed no change. Decreases were registered in only 88 instances as compared with 118 during the month of January.

Wholesale prices of foods showed the second largest price increase, the

group as a whole advancing by nearly 4 per cent.

The metal and metal products group registered a rise of 1 3/4 per cent due largely to advancing prices for steel scrap, motor vehicles, quicksilver, bar silver, plumbing and heating materials, and certain other iron and steel items. The non-ferrous metals subgroup showed a weakening in prices, while no change occurred in agricultural implements. The group as a whole is now 12 1/2 per cent above the level of February of last year and more than 13 per cent over the low point reached in April, 1933.

PWA Is Spending 129 Million for Power Plants

WASHINGTON, March 27.—PWA allotments for power generating and distributing plants now total \$128,860,000, according to an announcement by Secretary Ickes, Public Works Administrator. Of this total, \$104,160,000 is being spent by the Federal Government and \$24,700,000 has been allotted to 50 non-Federal projects. The Federal projects are being constructed by the Government, which will own and operate them. The non-Federal projects are being constructed by local governmental subdivisions which are public bodies, so the projects will be publicly owned and operated.

The Corps of Engineers, War Department, is building two of the Federal projects which are being constructed for flood control and river navigation purposes as well as power development. One of these projects is the Bonneville Dam on the Columbia River about 40 miles upstream from Portland, Ore., and the other is the Fort Peck Dam on the Missouri River in eastern Montana. An allotment of \$20,000,000 has been made to the Corps of Engineers to commence construction of the Bonneville Dam and power plant and \$25,000,000 to commence construction of the Fort Peck Dam.

The Bureau of Reclamation, Department of the Interior, has been allotted \$59,160,000 for three projects. With an allotment of \$15,000,000 it is beginning construction of the Grand Coulee Dam on the Columbia River, about 75 miles west of Spokane, Wash. The total cost of this project when finished will be \$62,200,000 and it will generate 700,000 hp. An allotment of \$38,000,000 was made to the Reclamation Bureau to carry forward construction of Boulder Dam, \$10,000,000 of it being for machinery to be installed in the power plant. Power will be developed by the Seminole unit of the Caspar-Alcova project for irrigation, reclamation and power development. The Seminole Dam will

Per cent of change between Feb. 1934 and
Low since June
1929 and month
in which low
point was reached

Group	Feb. 1933	June 1929	Year 1929	Low since June 1929 and month in which low point was reached
ALL COMMODITIES.....	+ 23.1	- 22.7	- 22.8	+ 23.1 (Feb. 1933)
Farm products	+ 49.9	- 40.7	- 41.6	+ 49.9 (Feb. 1933)
Foods	+ 24.2	- 32.7	- 33.2	+ 24.2 (Feb. 1933)
Hides and leather products	+ 31.8	- 17.0	- 17.9	+ 31.8 (Feb. 1933)
Textile products	+ 50.2	- 14.7	- 14.9	+ 50.2 (Feb. 1933)
Fuel and lighting	+ 13.8	- 14.3	- 12.8	+ 19.9 (May 1933)
Metals and metal products	+ 12.4	- 14.0	- 13.4	+ 13.1 (Apr. 1933)
Building materials	+ 24.1	- 9.0	- 9.2	+ 24.1 (Feb. 1933)
Chemicals and drugs	+ 5.9	- 19.2	- 19.9	+ 6.0 (Mar. 1933)
Housefurnishing goods	+ 12.0	- 14.4	- 14.1	+ 13.3 (Apr. 1933)
Miscellaneous	+ 15.7	- 16.9	- 17.1	+ 18.5 (Apr. 1933)
Raw materials	+ 36.4	- 31.7	- 32.3	+ 36.4 (Feb. 1933)
Semimanufactured articles	+ 32.9	- 19.0	- 20.3	+ 32.9 (Feb. 1933)
Finished products	+ 17.2	- 18.9	- 18.5	+ 17.2 (Feb. 1933)
Nonagricultural commodities.....	+ 19.5	- 18.6	- 18.4	+ 19.5 (Feb. 1933)
All commodities other than farm products and food	+ 19.2	- 14.4	- 14.1	+ 20.5 (Apr. 1933)

be built in the Granite Canyon of the North Platte River about 33 miles from Rawlins, Wyo. About 51,000 hp. will be developed. The dam and power plant will cost approximately \$6,160,000. PWA has allocated \$12,000,000 to the entire Caspar-Alcova project.

Prices Filed With Institute

NEW lowest base prices filed with the American Iron and Steel Institute include:

	Base Price Per Lb.	F. O. B. Basing Point
Genuine puddled wrought iron skelp (effective March 30)		
For widths 8 1/4 in. and less 4c.		Coatesville, Pa.
For widths 8 1/4 to 47 in. 4 1/4 c.		Coatesville, Pa.
For widths 47 in. and over 8c.		Coatesville, Pa.

EXTRA STRONG PIPE

Size	List Price Per Foot	O.D.	Thickness	Weight Per Foot Plain Ends
1/4 in.	\$0.07 1/2	0.540	0.119	0.53
3/8 in.	0.07 1/2	0.675	0.126	0.73
1/2 in.	0.11	0.840	0.147	1.08
3/4 in.	0.15	1.050	0.154	1.47
1 in.	0.22	1.315	0.179	2.17
1 1/4 in.	0.30	1.660	0.191	2.99
1 1/2 in.	0.36 1/2	1.900	0.200	3.63
2 in.	0.50 1/2	2.375	0.218	5.02
2 1/2 in.	0.77	2.875	0.276	7.66
3 in.	1.03	3.500	0.300	10.25

The list prices shown above are subject to the following basing discounts:

Product Classification	F.O.B. Pittsburgh (April 3)	F.O.B. Gary (April 5)
1/4 in. and 3/8 in.—black	54 1/2-5-5%	52 1/2-5-5%
1/2 in.—black	60 -5-5%	58 -5-5%
3/4 in.—black	64 1/2-5-5%	62 1/2-5-5%
1 in. to 3 in.—black	66 1/2-5-5%	64 1/2-5-5%
1/4 in. and 3/8 in.—galv.	41 1/2-5-5%	39 1/2-5-5%
1/2 in.—galv.	51 -5-5%	49 -5-5%
3/4 in.—galv.	55 1/2-5-5%	53 1/2-5-5%
1 in. to 3 in.—galv.	58 1/2-5-5%	56 1/2-5-5%

STANDARD WEIGHT PIPE

Size	List Price Per Foot	O.D.	Thickness	Weight Per Foot Plain Ends
1/4 in.	\$0.06	0.540	0.088	0.42
3/8 in.	0.06	0.675	0.091	0.56
1/2 in.	0.08 1/2	0.840	0.109	0.85
3/4 in.	0.11 1/2	1.050	0.113	1.13
1 in.	0.17	1.315	0.133	1.67
1 1/4 in.	0.23	1.660	0.140	2.27
1 1/2 in.	0.27 1/2	1.900	0.145	2.71
2 in.	0.37	2.375	0.154	3.65
2 1/2 in.	0.58 1/2	2.875	0.203	5.79
3 in.	0.76 1/2	3.500	0.216	7.57

The list prices shown above are subject to the following basing discounts:

Products Classification	F.O.B. Pittsburgh and Lorain, Ohio (Effective April 2)
1/4 in. and 3/8 in.—black	59 -5-5%
1/2 in.—black	64 -5-5%
3/4 in.—black	67 1/2-5-5%
1 in. to 3 in.—black	69 1/2-5-5%
1/4 in. and 3/8 in.—galv.	40 1/2-5-5%
1/2 in.—galv.	52 1/2-5-5%
3/4 in.—galv.	57 1/2-5-5%
1 in. to 3 in.—galv.	60 1/2-5-5%

The above prices apply to plain-end, random length pipe to be sold.

1—For direct shipment in carload lots to manufacturing consumer on direct sale to such consumer for structural use only.

2—For direct shipment in carload lots to manufacturing consumer on sales made through a jobber for structural use only.

On sales made through a jobber, an extreme commission of 5 per cent may be allowed to the jobber on the basing point value of the material.

The pipe sold under this schedule will be stenciled "STRUCTURAL" and must not be used for the conveyance of gas, steam, liquids or air.

Prices apply only to extra-strong pipe as listed above, to be furnished in carload lots only. The foregoing prices are for random lengths.

Product Classification	Base Price Per Gross Ton	F.O.B. Basing Point
Light rails (60 lb. or less per yard) (April 2)...	\$32	Pittsburgh
Jobber's allowance.....	2 per gross ton	
	Base Price Per 100 Lb. Basing Price	F.O.B. Basing Point
Bessemer or basic mfr. wire (March 31).....	\$2.30	Worcester, Mass.
Weaving wire (not for fly screen cloth) (March 31)	3.90	Worcester, Mass.

German Iron and Steel Continues Increase

GERMAN production of iron and steel registered notable increase during Jan., 1934, compared with the corresponding month of 1932, according to a report from Vice Consul James H. Wright, Cologne, made public by the Commerce Department.

Production of iron in Jan., 1934, amounted to 543,330 metric tons compared with 402,789 metric tons during Jan., 1933, an increase of 35 per cent. Dec., 1933, production amounted to 533,900 metric tons. Average daily production on a 31 working day basis throughout was 17,527 metric tons during Jan., 1934, 17,223 metric tons during Dec., 1933, and 12,993 metric tons during Jan., 1933.

German steel production during Jan., 1934, on a 26 working day basis, aggregated 817,083 metric tons compared with 730,565 metric tons during Dec., 1933, on a 24 working day basis during Dec., 1933, and 542,512 metric tons, on a 26 working day basis, during the month of Jan., 1933.

Average daily steel production was 31,426 metric tons during Jan., 1934, 30,440 metric tons during Dec., 1933, and 20,866 metric tons during Jan., 1933.

Truck Delivery Resolution Amended

COMMERCIAL resolution No. 8, dealing with prices on steel delivered by other than all-rail transportation, was amended on March 15 by the board of directors of the iron and steel code. The only change was an amplification of paragraph (e) relating to truck deliveries. The revised section of this paragraph follows:

(e) In any case in which any purchaser shall require that any product purchased by him from a member of the code be delivered by truck and such truck is provided, directly or indirectly, by such purchaser and for his account, such member of the code may allow a

reduction in the delivered price for such product otherwise chargeable under Section 4 of Schedule E of the code and the applicable resolutions adopted by the board of directors thereunder and then in effect (a) at a rate equal to 65 per cent of the carload all-rail published tariff freight rate on such product from the point at which transportation of such product by truck began to the place of delivery of such product to such purchaser (if the freight charge be published on a per car basis, the rate per ton shall be determined by dividing such charge per car by 25), or (b), if the transportation by such truck be at a basing point for such product, then at a rate equal to 65 per cent of the rate of the applicable arbitrary carload switching charges, if any, at such basing point theretofore approved by the board of directors, or, if such board shall not have approved a rate of arbitrary carload switching charges for such basing point, 65 per cent of the rate per ton of the actual switching charges (computed on the basis of the minimum carload quantity to which such charges apply) applicable on the delivery of such product at such basing point under the provisions of such Section 4, from the point at which transportation of such product by truck began to the place of delivery of such product by truck to such purchaser.

Canadian Iron and Steel Market During 1933

WASHINGTON, March 27.—The Canadian market for heavy iron and steel products during 1933 was characterized by slackness during the first half of the year, according to a report from Assistant Trade Commissioner A. F. Peterson, Ottawa. This was followed, however, by increased demand during the last half when general economic conditions in Canada improved. The increase in the production of heavy steel during the last six months of 1933, while substantial, was lower than that recorded by some of the other industries, due to the greater handicaps to recovery faced by the heavy industries of Canada.

Despite the fact that Canada was in the unique position, for a steel producing country, of producing no pig iron from Feb. 14 to June 26, 1933, all of her blast furnaces having been out of operation during that period, her total pig iron production during the year amounted to 229,076 gross tons, which represented an increase of 59 per cent over the 1932 output. Production of ferro-alloys at 30,569 gross tons was above that for 1932, while steel at 407,981 tons recorded a gain of approximately 20 per cent over the previous year's output.

Beginning April 1, Lo-Swing, Short Cut and Star lathes built by the Seneca Falls Machine Co., Seneca Falls, N. Y., will be sold direct in the Detroit territory, including all of Michigan, by W. H. Nettle, 236 Richton Ave., Detroit.

Steel Fabricators Likely to Face a New Jersey Code

AN unsettling, if not menacing, movement has been quietly gaining momentum in New Jersey. It amounts to the development of a code of fair competition confined to application in that State in the field of structural steel fabrication and erection. Indications seem to point to early approval by the Governor of the State, and then under Chapter 372, P.L. 1933, the code will become operative. Because of the apparent secrecy with which the code has been pushed and the lack of precise knowledge concerning it in the hands of the larger fabricators at least, the feeling exists that somewhere there may lurk an ulterior motive that should be proved or disproved in the immediate future.

The operation of the code centers in a State association. This is defined in the code as the Structural Steel and Ornamental Iron Association of New Jersey, Inc., "a corporation organized for non-profit purposes. Any member of the industry," says the codes "may participate in the endeavors of the State association in the preparation of any revision, addition or supplement to, or administration of, this code, by accepting and paying the equitable share of the cost of creating and administering it by becoming a member of the State association and by paying to it the dues provided to be paid by a member of said association." The foregoing sentence is believed to be substantially a verbatim quotation from the document. A graduated scale of dues is contemplated, to be established upon some equitable basis to be determined by the association.

Establishes Minimum Cost for Each Job

What is specially interesting is the procedure to be followed in bidding for work. At least 48 hr. before the time of submitting bids, the member shall deliver to the code authority in a sealed envelope an itemized written statement containing the following information: location of project or structure; name of customer; name of architect or engineer in charge of the project; time and place bids are to be opened; itemized estimate of the amount of labor required, if erection only is to be done, or an itemized estimate of the quantities of metal products required if the bid covers furnishing the metal products, etc.

At least 36 hr. before the time, "if known," when the bids are scheduled to be opened, the envelopes shall be opened by one of the executive members of the code authority. Then the bidders are to be notified by telegraph to attend a meeting not less than 24

hr. before the time of the openings of the bids by the customer. The members of the industry then together, including the executive member of the code authority, who may himself be a bidder, "shall be deemed and constituted a committee of the code authority for the purpose of determining the reasonable cost of the metal products or the erection work or both for the execution of the specific program required," etc.

The reasonable cost then determined "shall be the minimum price below which no member of the industry shall bid." In case of disagreement regarding reasonable cost, the executive member shall fix the cost and he is not disqualified in so doing should he himself be a bidder.

The code authority is constituted by seven members of the code committee of the State association (such known as executive members) and one other person not necessarily a member of the industry (referred to as the asso-

ciate member), and nominated by the Governor.

THE IRON AGE did not learn, in its last minute discovery of this New Jersey steel fabricating and erecting code, what if anything is said of the status of companies not resident in that State in respect to attempting to participate in business in the State, but it did find that to receive communications and documents from the code authority the member of the industry must have a post office address in the State.

Some of the minor stipulations of the code instrument provide that the failure of any member of the industry to pay the amount of any assessment or partial assessment made against such member within 15 days after mailing of the notice shall constitute a violation of the code; moreover the code authority may sue any delinquent member for the amount of the assessment. The code authority is authorized to fix the minimum discounts or commissions which a member of the industry shall or may allow another member of the industry. Chief interest probably lies in the authority given the code administrators, and also in the method, to determine the lowest reasonable cost below which no bidder may go.

Equipment Firms Can Finance Good Risks

SINCE the results of the farm-housing survey have been coming in from counties in many States where Civil Works investigators are at work under the direction of the U. S. Department of Agriculture, there have been many indications that large manufacturers and merchandisers of building materials and home equipment are expecting a better demand for lumber, paint, roofing, hardware, water supply systems, heating and lighting plants and other home comforts and conveniences. Replies to a questionnaire recently sent by the farm housing survey to large mail order houses and manufacturers show a willingness to go as far as reasonable safety permits in extending credit for the purchase of such non-consumable goods.

The survey developed that many concerns are able to handle the financing of installment sales of their products at present and can do so even with a considerable increase in business. Some of them are using the facilities of credit companies. The additional cost to installment purchasers for periods of 6 months to 24 months is about 10 per cent over the cash price, depending on the time. In most cases those extending credit protect themselves through conditional sales and the advice of local agents

and stores. Most firms replying to the questionnaire show a desire to extend credit to good moral risks, but are not inclined to use high-pressure sales methods to stimulate buying. They report prices at as low a point as feasible now, but prices might be cut somewhat if volume of sales increases greatly. Some special renovation advertising campaigns on building material and equipment are under way and more would be started by some firms if more adequate financing were provided.

Under the CWA farm housing survey project surveys are being made in about 300 typical counties throughout the country. Reports of results in 30 counties have already come into the Department of Agriculture. They show a great need for repairs, improvements or more modern equipment in a large percentage of farm houses.

WASHINGTON, March 27.—Bids will be opened April 6 by the Bureau of Supplies and Accounts, Navy Department, for 1550 tons of black and 900 tons of galvanized sheets for seven coast guard cutters, four to be built at the Philadelphia, two at the Brooklyn and one at the Charleston, S. C., navy yard.

Products Development Co., Louisville, manufacturer of metal products, will move into Snead Building, West Market Street.

PERSONALS

W. F. DETWILER, general manager, Allegheny Steel Co., Brackenridge, Pa., has been appointed executive vice-president and a member of the board of directors. His association with the company began 26 years ago as an electrical engineer. He successively filled the offices of master mechanic, assistant and general superintendent and assistant and general manager. In his earlier career, he was identified with the Westinghouse Electric & Mfg. Co., with which he began as an electrical apprentice at an hourly wage of 4c. At the end of his 10-year apprenticeship, upon completion of which he received \$100 in gold, he became an operating plant man. He was born in Bedford County, Pa., 53 years ago, and is a member of the board of directors of the American Iron and Steel Institute.

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B. B. McCANDLISS, formerly treasurer of the Continental Steel Corp., Kokomo, Ind., has been elected president of the Graver Tank & Mfg. Co., Chicago, and the Phoenix Mfg. Co., Joliet, Ill. GEORGE V. MALMGREN has been made comptroller of the Graver company, and PHILIP S. GRAVER, formerly vice-president in charge of sales, has been made executive vice-president. EDWARD S. RIDGEWAY, formerly assistant to the vice-president, has been made general manager of sales.

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CHARLES B. FOSTER, heretofore assistant sales manager for excavators of the Harnischfeger Corp., Milwaukee, has been appointed sales manager of the entire P & H line of full revolving excavators. Mr. Foster, who is a graduate of Purdue University, started work on the assembly floor and later served in the export department as branch manager of the used equipment division.

♦ ♦ ♦

GEORGE S. WHYTE, president of the Macwhyte Co., Kenosha, Wis., has been elected president of the Wisconsin Manufacturers' Association for the third successive term. D. E. EVERST has been made vice-president, S. G. SCANLAAN, treasurer, and GEORGE KULL, secretary-manager.

♦ ♦ ♦

FRANK CONTEY, Frank Contey, Inc., Jersey City, was elected president of the New Jersey chapter of the Institute of Scrap Iron & Steel, at the annual meeting of the chapter on March 19, succeeding MEYER LOWENSTEIN. Other officers elected include: vice-president, RICHARD V. BONOMO, L. Schiavone & Bonomo Brothers, Jersey City; secretary-treasurer,

MURRAY KUNIN; chairman of executive committee, A. J. REICHMAN, Reichman & Hoffman Brothers, Newark. The executive committee, in addition to the officers, will consist of the following: T. J. MALARKY, Federal Iron & Metal Co., Newark; H. WERBLIN, Werblin Brothers, Somerville, and P. BOVASSO, Bovasso Brothers, Jersey City. B. H. RUBINE, Hudson Iron & Metal Co., Bayonne, was elected chairman of the local code authority, with the following additional members: RALPH RANIERI, of Pavonia Scrap Iron & Metal Co., Jersey City; ABRAHAM ISAAC, Elizabeth; MEYER LOWENSTEIN, Lowenstein Brothers, Newark, and ISRAEL CITRON, Citron-Byer Co., Trenton.

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HARVEY DIETERICH, manager of the structural department of Joseph T. Ryerson & Son, Inc., has been made assistant vice-president in charge of operations in the structural and special order departments in Chicago. He has been identified with the company for the past 30 years. AINSLIE Y. SAWYER, who has been associated with the company for 25 years, and who has served in almost every division of the sales department from manager of the export materials department to manager of the cold-finished steel division, has been appointed assistant general manager of sales.

♦ ♦ ♦

ELMER M. NAYLOR, vice-president, Naylor Pipe Co., Chicago, has been named administration member of the code authority for the supplementary code of the railroad car appliances industry. Mr. Naylor will serve without expense to the industry, unless the supplementary code authority agrees to bear the expense.

♦ ♦ ♦

E. L. SOLOMON, president, Max Solomon Co., Pittsburgh, has been elected chairman of the executive board of the Pittsburgh chapter of the Institute of Scrap Iron and Steel.

♦ ♦ ♦

L. C. WELCH, manager of the lubricating department, Standard Oil Co. (Indiana), has been named assistant general manager in charge of the lubricating and technical departments, effective April 1. He will continue to exercise general supervision over all sections of these two departments. C. O. WILSON, who has been assistant manager of the lubricating sales division, becomes manager of the lubricating department and industrial sales, and L. G. CAMPBELL, now assistant manager of lubricating bulk sales, becomes manager of lubricating bulk sales.

GEORGE A. DECKER, works engineer, Warner & Swasey Co., Cleveland, on March 23 celebrated the 52nd anniversary of his connection with the company, with which he started as an apprentice two years after the company's organization in 1880. He worked up through the organization to superintendent before he was advanced to his present position.

♦ ♦ ♦

DR. J. T. ROBSON has been placed in charge of laboratory and research activities of the Ferro Enamel Corp., Cleveland. Recently he had been with the Allied Engineering Co., Columbus, which was taken over as a branch of the Ferro Enamel Corp., and before that he was an instructor in ceramic engineering at Ohio State University, Columbus.

OBITUARY

EDMUND W. ZEH, president of the Zeh & Hahnemann Co., Newark, N. J., manufacturer of percussion power presses, died March 17, aged 66 years. Mr. Zeh came from Frankfort-on-Main, Germany, in 1893 and in 1907 founded the Newark company.

♦ ♦ ♦

JOHN HAMMOND KIMBALL, associated with the General Electric Co., Lynn, Mass., for 42 years, and at the time of his retirement two years ago manufacturing superintendent, died at Lynn on March 18. He was born at that city July 1, 1873.

♦ ♦ ♦

GEORGE A. CARTER, for many years a manufacturer of tacks and shoe nails in Brockton, Mass., died at his home in that city on March 20, after a long illness, at the age of 76. He began business in 1882.

Canadian Iron Output Declined in February

FEBRUARY production of pig iron in Canada totaled 12,199 gross tons, which was 60 per cent below the January output of 30,677 tons, but almost double the 6144 tons reported for February a year ago. During the month one furnace at Hamilton, Ont., was blown out, leaving only one furnace in Canada in blast on Feb. 28. The active furnace has a capacity of 450 tons daily and is located at Sault Ste. Marie, Ont.

According to the Dominion Bureau of Statistics, the February production of steel ingots and castings amounted to 57,999 tons, compared with 60,787 tons in January and 12,374 tons in February, 1933. The Dominion Bureau of Statistics index number of wholesale prices of "iron and its products", based on 100 for 1926, rose from 86.6 in January to 87.0 in February, chiefly because of higher prices for scrap iron and steel.

Automotive Settlement Regarded as Victory for Open Shop

THE settlement of the automotive labor dispute by President Roosevelt, as announced at the White House, Sunday evening, is regarded in Detroit as a decisive defeat for the American Federation of Labor in its campaign to unionize the automobile industry.

It has broader implications than that, however, for it is a crushing blow to Senator Robert F. Wagner and the members of the National Labor Board who have aided and abetted the Federation in establishing itself as the sole recognized representative of labor in collective bargaining. By inference at least, one can conclude that the attitude taken by the President, and agreed to by both the Federation and the National Automobile Chamber of Commerce, in giving employee representation a chance to function, is at variance with the purpose of the Wagner Bill which, without support from the Chief Executive, hasn't an especially good chance of passage in Congress in view of the strong opposition developed in the last ten days.

Federation Has Public Responsibility

Perhaps the most significant part of the Presidential statement pertaining to the automobile truce is the last two paragraphs in which the Federation clearly is told that it as well as industry has a public responsibility under the National Recovery Act. Said the President:

"This is not a one-sided statute, and organizations of employees seeking to exercise their representative rights cannot at the same time be unmindful of their responsibilities. Industry's obligations are clearly set forth and its responsibilities are established. It is not too much to expect organizations of employees to observe the same ethical and moral responsibilities even though they are not specifically prescribed by the statute. Only in this way can industry and its workers go forward with a united front in their assault on depression and gain for both the desired benefits of continually better times."

Minority Groups To Be Represented

The Presidential statement assumes added importance as the first detailed interpretation of Section 7-a of NRA emanating from the White House. The Rooseveltian ruling that minority

By BURNHAM FINNEY
Detroit Editor, THE IRON AGE

groups shall be represented in collective bargaining is a direct reversal of the decision of the National Labor Board in the labor controversy involving the Denver Tramway Corp'n. The board ruled in that case that the agency selected by a majority of the employees should be the sole representative of all of the workers in collective bargaining with the management.

Unanimously approved by the Federation and the National Automobile Chamber of Commerce, the settlement plan specifies that the NRA shall set up a board of three members to sit in Detroit and pass on all questions of representation, discharge and discrimination. This board, consisting of a representative of labor, a representative of industry and a neutral person, is to have access to all payrolls and to lists of claimed employee representation. Its decision "shall be final and binding on employer and employees."

The plan definitely states that if the union refuses to disclose the list of its members to the management, "there shall be no basis for a claim of discrimination." However, as a protection to employees, no such disclosure in a particular case shall be made without specific direction of the President.

Employees have the right to organize into a group or groups. If there be more than one group, each bargaining committee shall have total membership pro rata to the number of men each member represents.

Federation Retreats

How far the Federation retreated when it accepted these provisions is realized when one remembers that it was holding out for new employee elections outside the automobile plants where workers should choose between the Federation and company unions as their agency for collective bargaining. If the Federation won a majority, it should be the spokesman for all employees. In the election a plainly designated Federation slate of repre-

sentatives should run against a company union slate.

Discrimination against union members in layoffs in automobile plants, one of the charges made by the Federation, has been one of the bitterest sources of strife. The layoff of a union man, whether he was one of the more efficient or less efficient employees, has been the instant signal for trouble. The President has met this issue squarely with the declaration that "the industry understands that in reduction or increases of force, such human relationships as married men with families shall come first and then seniority, individual skill and efficient service. After these factors have been considered, no greater proportion of outside union employees similarly situated shall be laid off than of other employees." By outside union employees is understood a paid-up member in good standing, or anyone legally obligated to pay up.

In the administration of the NRA the Federal Government often has been charged with seeking to perpetuate and extend the rule of the American Federation of Labor. The actions of the National Labor Board, seemingly carried out with the tacit consent of the White House, have deepened that impression. Yet the document made public by President Roosevelt meticulously states that the Government is not interested in the kind of union chosen for collective bargaining by employees, but merely in seeing that workers are free to select whomever they wish to represent them.

Government Favors No Particular Union

The President's words are as follows: "The Government makes it clear that it favors no particular union or particular form of employee organization or representation. The Government's only duty is to secure absolute and uninfluenced freedom of choice without coercion, restraint, or intimidation from any source."

Mr. Roosevelt has high hopes that the plan for handling industrial relations in the automobile industry will be adopted by other industries. His enthusiasm is disclosed by his remark that "in the settlement just reached we have charted a new course in social engineering in the United States." It is again evident in his statement that

"for the first time in any large industry, a more comprehensive, a more adequate and a more equitable system of industrial relations may be built than ever before."

The automobile industry is not unmindful of its obligations under the new plan. It is fully cognizant of the fact that some of its employee representation plans were not all that they should have been. Happenings of the last two weeks have made it imperative that certain provisions in these plans be altered immediately so that employees shall be assured that these organizations are functioning efficiently.

President Roosevelt's terms are a victory for both management and labor, and by labor is meant automotive employees who have been given full recognition in collective bargaining. As one observer put it, "The only loser in the final negotiations was the American Federation of Labor." It is the consensus of opinion in Detroit that the settlement agreed upon is a blow to the Federation in its campaign in the automobile industry from which it will not recover.

On the same day that Mr. Roosevelt announced a settlement of the automotive dispute, Father Charles Coughlin, famed radio priest of Detroit, vigorously attacked the American Federation of Labor in his weekly national broadcast. He said that "had the A. F. of L. been efficient, there is no question but with their thirty million dollars a year, with their nine hundred million dollars for over thirty years, they and their affiliates should have gone 30 times as far as they have gone today, but . . . they stood stupefied when the so-called open shop of the City of Detroit voluntarily raised wages to a minimum of \$5 a day in the automotive industry, and set up as their chief representative here in Detroit a nationally-known individual whose name has time after time been associated with racketeering."

Referring to the Wagner Bill, Father Coughlin asked, "Is the Wagner Bill complete unless it removes the class bigotry from the American Federation of Labor, unless it tempers its financial power, unless it sets up a code of fair play for the laborer as well as fair play for industry?"

While the final settlement of the automotive labor controversy was being made in Washington, a number of motor car makers posted notices in their plants that a general 36-hour week, with pay increases to give employees the same wages they were making for a 40-hour week, would become effective on or before March 31. The companies involved are General Motors Corp., Chrysler Corp., Packard, Graham-Paige, Hudson and Hupmobile. Ford announced an increase in minimum wages to \$5 a day about two weeks ago.

Although the plan made public by President Roosevelt lays down broad rules for employee representation in collective bargaining it does not set forth a detailed explanation of how these rules are to be applied. Meetings are being held in Detroit today to put in motion immediately the machinery provided by the plan. It is believed that the works councils already established by many companies such as General Motors and Chrysler will be used as the collective bargaining agencies in the various plants. However, where the American Federation of Labor or any other labor group can prove that it represents a certain proportion of the employees it will be accorded seats in the works councils.

Without an official interpretation to the contrary it is assumed that decisions in the works councils will be made by majority vote. If this rule holds it is possible that in certain plants the A. F. of L. may be the dominant faction and its ideas may prevail. Whether the newly created arbitration board orders special elections in any plants or not the constitutions of the present works councils provide for annual elections in the Fall, at which time a test of the A. F. of L. strength is assured. It is indicated that the board immediately will start to check lists of union members against company payrolls to decide the proportional representation on the works councils called for by the settlement. However, it is not known what procedure will be followed in determining the affiliations of workers who belong both to company unions and outside unions.

Ford Status in Question

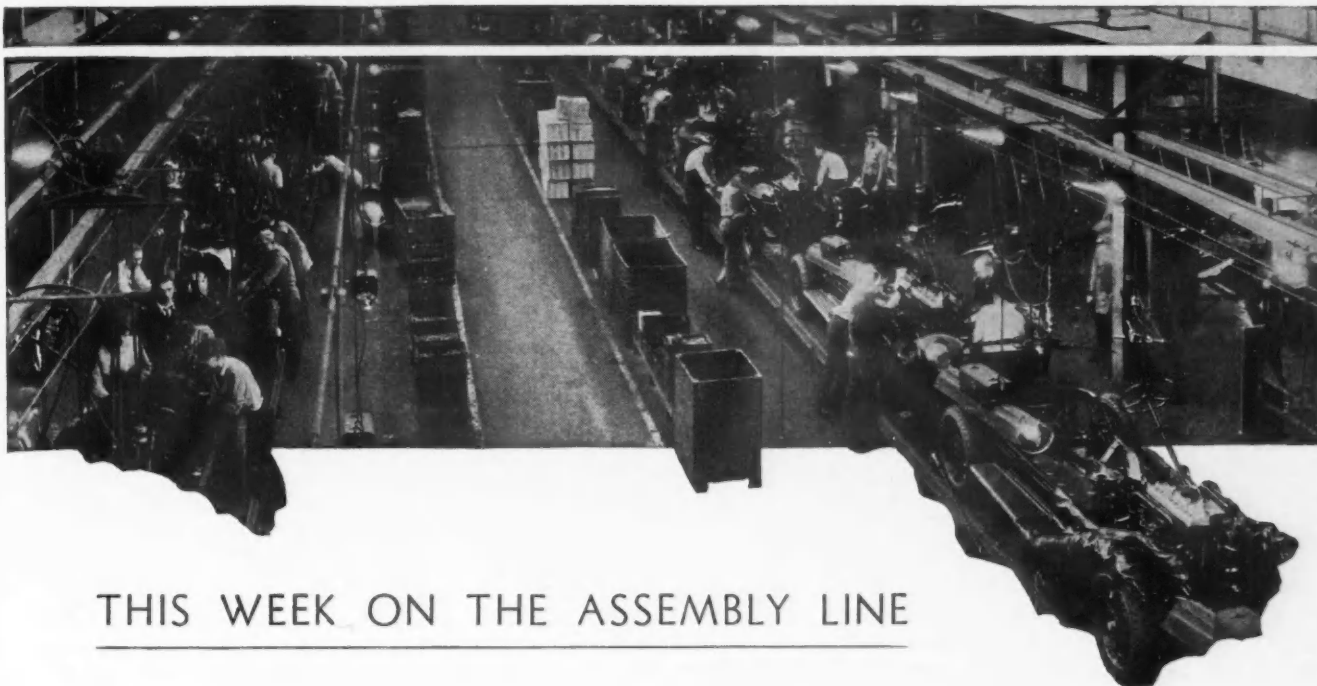
Although the Presidential plan undoubtedly is designed for the entire automobile industry the question has been raised as to whether it is to be applied to the Ford Motor Co. which is not a member of the National Automobile Chamber of Commerce and which has not yet made even a gesture toward setting up machinery for employee representation in collective bargaining. It is regarded as probable that the A. F. of L. will request that the plan be accepted by Ford on the theory that conditions throughout the industry must be uniform.

It is generally agreed in automotive circles that the labor settlement is a challenge by President Roosevelt to the automobile manufacturers and to steel companies as well to prove their contention that employee representation of the so-called company union type gives adequate and fair opportunity to their workers to bargain collectively with the managements. If the companies are not able or willing to give their workers more than outside unions can give them they will have no complaint to make in the months ahead if the A. F. of L. gains an ascendancy in the industry. However, the narrow escape from a seri-

ous strike has had a salutary effect on the industry and every effort will be exerted to improve immediately the relationships of management to employees.

Matthew Smith, general secretary of the Mechanics Educational Society, struck the only discordant note in an otherwise harmonious situation when he dispatched to President Roosevelt and General Johnson telegrams condemning the settlement as a "shabby joke insofar as justice for our members is concerned." He described the pact as "a Versailles treaty of industry possessing more germs of future industrial strife than the pre-dispute set-up." He said that "clause 2 of the strike settlement terms with its pro-rata representation on bargaining committees means that all minorities of highly skilled men such as tool and die designers, tool and die makers and pattern makers lose their identity and their right of collective bargaining. As an example, in Detroit's large plants, die designers and die makers often are only 1 per cent of the total payroll and a bargaining committee would have to be a hundred strong to give these craftsmen one representative. Assuming this is correct representation, our society will resist swiftly with the only weapon available when reason and justice are denied." Mr. Smith is reported to have remarked that "the society feels that the A. F. of L. representatives have been outsmarted in allowing a wage and hours dispute to be translated into a technical discussion of collective bargaining representation. By the time agreements are settled production will be finished and action impossible. We don't like to speak with disrespect to the aged but we feel that old man A. F. of L. is slipping into senility."

The labor representative on the new board will be Richard L. Byrd, secretary of the Pontiac group of locals affiliated with the American Federation of Labor. Forty-two years of age, he has been employed at various times by the Fisher Body plants at Cleveland, Detroit, and Pontiac, and later at the General Motors Truck Co. in Pontiac. Since last November he has been out of a factory job. He was a member of the labor delegation which conferred with the President last week and is said to have handled negotiations for his group so skillfully that he was nominated by the automobile workers as their representative on the board. In 1912 he was a member of the American Olympic team winning points in the weight throwing contest at Stockholm, Sweden. During the war he was in the Marine Corps, being awarded a lieutenant's commission. While the labor peace plan is looked upon as an A. F. of L. setback, it is likely that the Federation will redouble its efforts to make a permanent place for itself in the automobile industry.



THIS WEEK ON THE ASSEMBLY LINE

Automotive Labor Crisis Causes Sharp Decline in Steel Orders

DETROIT, March 27.

THE labor crisis in the automobile industry has left its mark on business at Detroit the past week, giving a foretaste of what might have happened if the White House had not interceded to prevent a strike. District steel offices report a sharp decline in orders, the volume in some cases having dropped almost to zero. Motor car plants have asked mills to hold up shipments on tonnages rolled for rush delivery. The parts trade, of course, has been similarly affected, and machine tool programs are being held in abeyance until labor difficulties are completely adjusted.

Efficiency of production in metal-working plants in this district as well as in automobile manufacturing plants has been materially lowered because of the tension under which workers have been laboring during the last two weeks. The strike fear has taken its toll on all forms of retail trade, including purchases of automobiles. Knowing how disastrous a strike would be to national recovery, people have hesitated to spend their money until they learn definitely what lies ahead.

Despite impairment of confidence which recent events in the automobile industry have produced, if the threat of a strike is permanently quashed, the damage to business will not be lasting. Car assemblies have been scarcely affected, and the month

promises to end with a total output of 325,000 cars. April will see a further boost in operations, probably beyond the 400,000 mark.

Production Gains on Sales

There are signs that some companies are catching up with retail demand after an unusually slow start. Plymouth dealers in Detroit are advertising immediate deliveries, whereas recently a retail buyer couldn't secure a Plymouth car for several weeks. Cadillac has announced that the backlog of orders for its eights has been cleaned up to the point where the factory can make prompt deliveries. This development gives emphasis to the fact that upon the trend of retail demand in the next 30 days depends the extent of automobile production in May and June. Sales departments of motor car companies have been crowding production departments for cars so that dealers will have at least moderate stocks for the spring season. Now the duty incumbent upon the sales executives is to sell these cars.

Unless the country has an unexpected economic setback, it is not too much to expect that retail automobile sales will be strong enough to support a second quarter output of 1,100,000 units, compared with 677,266 units in the corresponding quarter of 1933. With the initial quarter's assemblies estimated at 725,000 units,

this would put production for the first half of 1934 at 1,825,000 units, as against 1,045,372 units in the same period of last year.

It likewise would leave 775,000 units to be turned out in the final half of the year, if the conservative predictions of a 1934 output of 2,600,000 units are realized, or 1,175,000 units if the estimates of the more optimistic members of the automotive fraternity, who envision a three-million-car year, prove correct.

Users Have Liberal Steel Stocks

While the strike threat deservedly bears the brunt of the blame for an almost precipitate decline in steel bookings at Detroit, another factor is partially responsible. Many automobile companies ordered steel at a high rate for weeks and took it into their plants in a volume considerably greater than their production. The result was an expansion of steel stocks. Then too it should be remembered that some manufacturers, like Chrysler, have not yet fabricated all of the steel which was taken in at low prices last year. Ford normally purchases steel in the final 10 days of a month to cover its needs for the following month, but for April is buying relatively little because accumulated steel stocks at the Rouge plant are larger than normal.

There is still another consideration contributing to a temporary lull in steel releases. Many of the important manufacturers are faced with the physical impossibility of taking into their plants more parts or materials at this time. Steel already is stored in places not intended for that purpose, and this alone presents a han-

dling problem which is troublesome and expensive.

Steel Consumers Want Contracts

With a wage increase in the near future highly probable in the steel industry, thus making a price advance likely, automotive steel users are scurrying to get under contract for the second quarter. However, they would probably be given 10 days' notice of a rise in prices and in that period could specify their requirements. A plan of putting new price schedules into immediate effect or reducing the waiting period is said to be under consideration, and it is the possibility of such a change in selling practice which is said to be instrumental in developing the demand for contracts on the part of the automotive people. Both General Motors' divisions and Chrysler are said to be insistent upon the signing of contracts, and inquiries have been made by other steel consumers.

Federal Trade Report Considered

Detroit is particularly interested in the attack made by the Federal Trade Commission on the arbitrary freight rates to southern Michigan on steel bars, sheets and hot-rolled strip. Arbitrary freight rates, as now applied in southern Michigan, come in for considerable criticism from users not far distant. The loudest wail is heard from steel consumers at Toledo, mostly automotive parts people, who are at a disadvantage compared with rival companies at Detroit. Consumers at Lansing, who are within the special rate zone, likewise are not pleased with the present arrangement. In the first place, the arbitrary freight rate on steel bars to Detroit is 15c. per 100 lb. and on sheets and strip steel 20c., as against an all-rail rate of 26½c. from Pittsburgh. At Lansing the arbitrary rate on bars is 20c. and on the other products 25c., compared with an all-rail rate of 29c. Thus the Detroit user is better off than the Lansing user.

Present Plan Equitable

After all factors are reviewed, it is believed that the present plan is about as equitable an arrangement as can be made. The user pays a transportation charge midway between the all-rail rate and the water or truck rates. Local steel interests are understood to look with disfavor on establishment of Detroit as a basing point. This would place the local mill in a weak position to solicit business in Ohio and Indiana because of high freight rates from Detroit. As the matter now stands, it quotes Ohio customers on a Pittsburgh base and Indiana users largely on a Chicago base.

More Stainless Steel Used

Stainless steel is making slow, but steady, progress in the automobile industry. Although no figures are avail-

able showing the amount of stainless steel used per car, it is known that more parts are being made of this material today than ever before. Ford has increased the number of parts to about six, the main applications being the head lamp shell and door, tail lamp shell and door, cowl lamps, hub cap and hood hinge. Ford consumption runs around 5 to 6 lb. per car, whereas in the days when the radiator shell was being made of stainless steel the average was 10 to 11 lb.

General Motors and Chrysler are utilizing stainless steel for more parts each year, especially for body molding and running board trim. The limiting factor in expansion of stainless steel sales is the price of this material. However, producers rightly emphasize that the cost should not be determined by the market price, but rather by the cost of the finished article after fabrication. In this respect it is significant that some motor car companies, which have laid down a rigid rule that they will not specify stainless steel if the finished part costs more than chromium-plated carbon steel, have recently gone over to stainless steel for a few new parts.

The assertion has been made that stainless steel prices are considerably higher than is justified by production costs. In reply to this charge, made informally by a large automobile company, mills declare that the cost of raw materials has declined very little, nickel having stayed at a relatively high level and ferrochrome having come down only slightly. Despite heavy operations recently, stainless mills have been able to make but a small profit.

Motor car manufacturers probably are the largest source of business for stainless steel. However, design changes which occur yearly or even more frequently may at any time limit the use of stainless steel, so that the volume of consumption is not so steady as producers might desire. It is notable that the Airflow cars of Chrysler and DeSoto, which seemingly are indicative of the industry's trend, are of such design that stainless steel can be economically employed. Thus no curtailment of demand is in sight.

Stainless Steel Favored for Engine Parts

The tendency in the automobile industry has been to specify stainless steel only on outside parts where it can be seen. Users now are viewing with increasing favor its use for engine parts, such as shafts, bolts and nuts, because of its strong resistance to high temperatures. Consumers are constantly seeking a reduction in the thickness of stainless steel for their products, the decreased weight of the metal more than offsetting the increased rolling cost. For this reason more and more stainless steel is being produced on strip mills, and any shortage of production facilities which

might eventuate probably would be in stainless strip capacity.

Incidentally, aside from the automobile industry, the electric refrigeration industry offers a rich market. One company is making evaporators out of stainless material. The Federal Government's naval program will bring business to stainless steel manufacturers, lattice-work masts being made from 18-8 material and fuel tanks for submarines and cruisers likewise calling for rust-resisting steel.

Detroit Notes

On March 15 Chrysler Sales Corp. had 21,410 unfilled dealer orders for Chrysler cars to be shipped before April 30. Almost half of the orders were for Airflows. March 14 was the largest Chrysler production of the year, 425 cars having left the factory. The daily average, which will be sustained during April, has been over 300 units. . . . Hudson already this year has shipped more than half the number of Terraplanes and Hudsons made in all of 1933. Factory shipments are running around 3900 a week. . . . Dodge has passed the 5000-a-week mark. In the first eleven weeks of this year it made retail deliveries of 35,024 units, compared with 15,396 in the same period a year ago.

Orders for La Salles are sufficient to keep the local Cadillac plant operating on La Salles alone for the next three months. Present production is 85 La Salles a day. . . . Persistent reports say that a new car may be manufactured in the old Durant plant at Lansing, which was purchased recently by a so-called dummy company. One story is that the car being designed by the R. E. Cole Engineering Co., Detroit, is to be made by the new company. However, Mr. Cole refuses to talk at present about his plans, except to admit that his staff is designing a new car. . . . Engineering activities at Packard are indicative of changes in the making. . . . Reports that Ford has excessive field stocks are not accurate. Retail stocks actually are less than the Ford company had counted on having at the opening of the spring season.

National Steel Co. Reelects Directors

AT the annual meeting of the stockholders of the National Steel Corp. at Pittsburgh on March 26 all directors were reelected. Lacking a quorum of directors, action on election of officers was deferred until the next regular board meeting at Pittsburgh on April 10, when dividend action will also be taken. A resolution by the stockholders, commending the action of the company's management throughout the period of controversy with the National Labor Board was unanimously approved.

Resurgence of Confidence Follows Settlement of Labor Dispute

Bookings from Automobile Industry Are Again Picking Up; Railroad Releases Increase; Steel Output Dips to 48 Per Cent of Capacity

THE President's success in averting an automobile strike has revived hopes in the iron and steel trade for a resumption of the upward sweep of demand that was interrupted early this month. The settlement of the labor controversy came too late to prevent a further setback in production, but the rapidity with which bookings from the motor car manufacturers have recovered and the steady increase in business from the railroads indicate that the loss is only temporary.

Steel output at Cleveland has declined six points to 63 per cent of capacity and the rate in the Wheeling district is off five points to 70 per cent, but production in the Philadelphia district has forged ahead two points to 36 per cent, while operations in other producing centers remain substantially unchanged. The national average, at 48 per cent, compares with 48½ per cent in the two preceding weeks and 49 per cent in the first week of March, the peak rate to date this year.

HEAVER railroad releases are commencing to have a real effect on mill operations at Chicago, Pittsburgh and in eastern Pennsylvania. Although the view is gaining ground that demand from the motor car industry will show no further expansion, this opinion does not take into account the loss in retail sales attributable to the strike threat. Not alone automobile sales, but the entire retail trade suffered because of widespread popular apprehension of the effects of a major strike on national recovery.

The feeling of relief that followed the settlement of the controversy has brought with it an appreciation of the necessity for reinforcing public confidence. In this spirit a number of steel producers have announced a further advance of 10 per cent in wage rates, effective April 1, and it is probable that other companies will soon take similar action. A rise in steel prices is regarded as a logical sequel, since it is unlikely that volume will expand sufficiently in April or May to cover the added cost. The course of pig iron prices is still in doubt, but, if present demands of coal miners are met, advances will become a certainty.

THE Boston & Maine has bought 30,000 tons of rails, together with necessary fastenings. The New York Central will momentarily place orders for 40,000 tons of rails, and has taken Clayton act bids on its second quarter requirements of plates, shapes, bars and sheets, amounting to about 11,000 tons. The Norfolk & Western is receiving tenders this week on 4500 tons of plates and shapes, and the Pennsylvania has taken figures on an indeterminate tonnage of various finished steel products for second quarter. The Great

Northern will buy 20,000 tons of rails and 6000 tons of accessories, and the Chicago Great Western has obtained a Government loan to build 500 freight cars.

Not only is railroad buying mounting, but releases of railroad steel against past orders are beginning to reach the mills in real volume. Contracts for a considerable portion of 175,000 tons required for the Van Sweringen cars have been placed, but actual orders for the steel are delayed pending the completion of standard car specifications. The distribution of this tonnage by the carbuilders so as to yield the purchasing railroads a maximum haul is forcing producers to absorb freight to distant basing points, thereby sharply reducing the net prices realized at their mills.

Fabricated structural steel awards, at 12,250 tons, compare with 29,200 tons in the previous week. A State hospital on Long Island accounts for 2460 tons. Plate awards of 13,000 tons include 10,660 tons for a welded pipe line to be laid in St. Louis. Plate inquiries of 12,000 tons include 8000 tons for tunnel liners at Fort Peck, Mont. Steel purchases for the Midtown tunnel, New York, total 5500 tons.

THE Federal Trade Commission's attack on the steel code is regarded as a political move, designed to discredit the National Recovery Administration, which had preempted the trade body's powers to discipline industry. The evidence offered to prove that small enterprises have suffered under the code does not impress an industry which has been under constant pressure from its larger customers because of the present policy of price parity for all buyers regardless of their size.

An inquiry for 50,000 tons of iron ore, the first of the season, has been issued by the Ford Motor Co. Reaffirmation of last season's prices is expected.

PIG IRON shipments are holding up well. At Chicago the March total will exceed that of February by at least 25 per cent. Domestic fluorspar has been advanced \$1 a ton. Connellsville beehive furnace coke, for shipment on one-year contracts, has been reduced 25c. to \$3.25 a ton, ovens. The spot delivery price is unchanged at \$3.50.

Scrap has not yet reacted to the passing of the labor crisis and is unchanged in price in most centers. At Buffalo a large mill took advantage of price recessions to supplement recent orders. Its purchases in the past fortnight are estimated at 40,000 tons.

THE IRON AGE composite prices for pig iron, scrap and finished steel are unchanged at \$16.90 a ton, \$12.67 a ton and 2.028c. a lb.

▲▲▲ A Comparison of Prices ▲▲▲

Market Prices at Date, and One Week, One Month, and One Year Previous
Advances Over Past Week in Heavy Type, Declines in Italics

Pig Iron

	Mar. 27, 1934	Mar. 20, 1934	Feb. 27, 1934	Mar. 28, 1933
<i>Per Gross Ton:</i>				
No. 2 fdy., Philadelphia	\$19.26	\$19.26	\$19.26	\$13.34
No. 2, Valley furnace	17.50	17.50	17.50	14.50
No. 2 Southern, Cin'tl.	18.13	18.13	18.13	13.81
No. 2, Birmingham†	13.50	13.50	13.50	11.00
No. 2 foundry, Chicago*	17.50	17.50	17.50	15.50
Basic, del'd eastern Pa.	18.76	18.76	18.76	13.50
Basic, Valley furnace	17.00	17.00	17.00	13.50
Valley Bessemer, del'd P'gh.	19.76	19.76	19.76	16.89
Malleable, Chicago	17.50	17.50	17.50	15.50
Malleable, Valley	17.50	17.50	17.50	14.50
L. S. charcoal, Chicago	23.54	23.54	23.54	23.17
Ferromanganese, seab'd car-lots	85.00	85.00	85.00	68.00

†This quotation is for delivery in South; in the North prices are 38c. a ton under delivered quotations from nearest Northern furnace.

*The switching charge for delivery to foundries in the Chicago district is 60c. per ton.

Rails, Billets, etc.

<i>Per Gross Ton:</i>				
Rails, heavy, at mill	\$36.37 1/2	\$36.37 1/2	\$36.37 1/2	\$40.00
Light rails, Pittsburgh	32.00	32.00	32.00	30.00
Rerolling billets, Pittsburgh	26.00	26.00	26.00	26.00
Sheet bars, Pittsburgh	26.00	26.00	26.00	26.00
Slabs, Pittsburgh	26.00	26.00	26.00	26.00
Forging billets, Pittsburgh	31.00	31.00	31.00	31.00
Wire rods, Pittsburgh	36.00	36.00	36.00	35.00
	Cents	Cents	Cents	Cents
Skelp, grvd. steel, P'gh, lb.	1.60	1.60	1.60	1.60

Finished Steel

<i>Per Lb.:</i>				
Bars, Pittsburgh	1.75	1.75	1.75	1.60
Bars, Chicago	1.80	1.80	1.80	1.70
Bars, Cleveland	1.80	1.80	1.80	1.65
Bars, New York	2.08	2.08	2.08	1.95
Plates, Pittsburgh	1.70	1.70	1.70	1.60
Plates, Chicago	1.75	1.75	1.75	1.70
Plates, New York	1.98	1.98	1.98	1.648
Structural shapes, Pittsburgh	1.70	1.70	1.70	1.60
Structural shapes, Chicago	1.75	1.75	1.75	1.70
Structural shapes, New York	1.95 1/4	1.95 1/4	1.95 1/4	1.86775
Cold-finished bars, Pittsburgh	2.10	2.10	2.10	1.70
Hot-rolled strips, Pittsburgh	1.75	1.75	1.75	1.45
Cold-rolled strips, Pittsburgh	2.40	2.40	2.40	1.80

On export business there are frequent variations from the above prices. Also, in domestic business, there is at times a range of prices on various products, as shown in our detailed price tables.

Finished Steel

	Mar. 27, 1934	Mar. 20, 1934	Feb. 27, 1934	Mar. 28, 1933
<i>Per Lb.:</i>				
Hot-rolled annealed sheets, No. 24, Pittsburgh	2.25	2.25	2.25	2.00
Hot-rolled annealed sheets, No. 24, Chicago dist. mill	2.35	2.35	2.35	2.10
Sheets, galv., No. 24, P'gh.	2.85	2.85	2.85	2.60
Sheets, galv., No. 24, Chicago dist. mill	2.95	2.95	2.95	2.70
Hot-rolled sheets, No. 10, P'gh	1.75	1.75	1.75	1.40
Hot-rolled sheets, No. 10, Chicago dist. mill	1.85	1.85	1.85	1.50
Wire nails, Pittsburgh	2.35	2.35	2.35	1.85
Wire nails, Chicago dist. mill	2.40	2.40	2.40	1.90
Plain wire, Pittsburgh	2.20	2.20	2.20	2.10
Plain wire, Chicago dist. mill	2.25	2.25	2.25	2.15
Barbed wire, galv., P'gh.	2.85	2.85	2.85	2.35
Barbed wire, galv., Chicago dist. mill	2.90	2.90	2.90	2.40
Tin plate, 100 lb. box, P'gh.	\$5.25	\$5.25	\$5.25	\$4.25

Scrap

<i>Per Gross Ton:</i>				
Heavy melting steel, P'gh.	\$14.25	\$14.25	\$14.75	\$9.25
Heavy melting steel, Phila.	11.75	11.75	11.75	6.75
Heavy melting steel, Ch'go.	12.00	12.00	11.75	5.25
Carwheels, Chicago	11.75	11.75	11.75	8.00
Carwheels, Philadelphia	13.00	13.00	12.75	8.00
No. 1 cast, Pittsburgh	13.75	13.75	13.25	9.00
No. 1 cast, Philadelphia	13.25	13.25	12.50	8.00
No. 1 cast, Ch'go (net ton)	9.50	9.50	9.50	6.25
No. 1 RR. wrot., Phila.	11.00	11.00	11.00	7.50
No. 1 RR. wrot., Ch'go (net)	9.50	9.50	9.50	4.50

Coke, Connellsville

<i>Per Net Ton at Oven:</i>				
Furnace coke, prompt	\$3.50	\$3.50	\$3.50	\$1.75
Foundry coke, prompt	4.25	4.25	4.25	2.50

Metals

<i>Per Lb. to Large Buyers:</i>				
Electrolytic copper, refinery	7.75	7.75	7.75	4.75
Lake copper, New York	8.00	8.00	8.00	5.00
Tin (Straits), New York	54.45	54.25	52.15	24.25
Zinc, East St. Louis	4.32 1/2	4.37 1/2	4.40	3.00
Zinc, New York	4.67 1/2	4.72 1/2	4.75	3.37
Lead, St. Louis	3.90	3.90	3.90	2.87 1/2
Lead, New York	4.00	4.00	4.00	3.00
Antimony (Asiatic), N. Y.	7.60	7.654	7.20	5.95

▲▲▲ The Iron Age Composite Prices ▲▲▲

Finished Steel

March 27, 1934	2.028c. a Lb.
One week ago	2.028c.
One month ago	2.028c.
One year ago	1.923c.

Based on steel bars, beams, tank plates, wire, rails, black pipe, sheets and hot-rolled strips. These products make 85 per cent of the United States output.

	HIGH	LOW
1934	2.028c., Mar. 20;	2.028c., Jan. 2
1933	2.036c., Oct. 3;	1.867c., Apr. 18
1932	1.977c., Oct. 4;	1.926c., Feb. 2
1931	2.037c., Jan. 13;	1.945c., Dec. 29
1930	2.273c., Jan. 7;	2.018c., Dec. 9
1929	2.317c., April 2;	2.273c., Oct. 29
1928	2.286c., Dec. 11;	2.217c., July 17
1927	2.402c., Jan. 4;	2.212c., Nov. 1

Pig Iron

\$16.90 a Gross Ton
16.90
16.90
13.56

Based on average of basic iron at Valley furnace and foundry irons at Chicago, Philadelphia, Buffalo, Valley and Birmingham.

	HIGH	LOW
1934	\$16.90, Mar. 20;	\$16.90, Jan. 27
1933	16.90, Dec. 5;	13.56, Jan. 3
1932	14.81, Jan. 5;	13.56, Dec. 6
1931	15.90, Jan. 6;	14.79, Dec. 15
1930	18.21, Jan. 7;	15.90, Dec. 16
1929	18.71, May 14;	18.21, Dec. 17
1928	18.59, Nov. 27;	17.04, July 24
1927	19.71, Jan. 4;	17.54, Nov. 1

Steel Scrap

\$12.67 a Gross Ton
12.67
12.75
7.08

Based on No. 1 heavy melting steel quotations at Pittsburgh, Philadelphia and Chicago.

	HIGH	LOW
1934	\$13.00, Mar. 13;	\$11.33, Jan. 2
1933	12.25, Aug. 8;	6.75, Jan. 3
1932	8.50, Jan. 12;	6.42, July 5
1931	11.33, Jan. 6;	8.50, Dec. 29
1930	15.00, Feb. 18;	11.25, Dec. 9
1929	17.58, Jan. 29;	14.08, Dec. 3
1928	16.50, Dec. 31;	13.08, July 2
1927	15.25, Jan. 11;	13.08, Nov. 22

Railroad Business Promises To Support Pittsburgh Rate



**Operations Hold at 32 Per Cent —
Imminent Wage Advances Expected to
Drive Up Steel Prices — Automobile
Peace Improves Sentiment**

PITTSBURGH, March 27. — The concordat reached between labor and management in the automotive industry has lessened considerably the stress of labor problems in the steel industry. Sentiment in the local steel district is, therefore, greatly improved, and no immediate marked recession in activity is now considered likely. Although this district has not benefited by steel tonnage from the automotive industry to the extent of other steel districts, it could not have well afforded the loss of tonnage that would have resulted from a serious automobile strike.

Specifications for sheets and strip from motor car manufacturers had already begun to pick up toward the close of last week, and some tonnage booked this week is considered very satisfactory. Most of this business, however, is for fairly prompt shipment, and second quarter contracting for light finished products has not gathered momentum.

The outlook for a fairly steady operating schedule is still supported by the large amount of potential railroad tonnage that remains to be placed. The approach of open weather probably will hasten the placement of further rail orders, so that laying can get under way. Carriers are also taking bids on second quarter requirement contracts, which will afford local producers with a fair amount of miscellaneous steel tonnage at the outset of the coming quarter.

Ingot output in the Pittsburgh area is maintained at 32 per cent of capacity. Production in the Youngstown district is likewise unchanged at 52 per cent, while in the Wheeling district output has dropped five points to 70 per cent.

Finishing mill schedules are evidently holding their ground. Sheet mills and strip mills are maintaining production at about 55 per cent. Tin plate mills have forged ahead slightly this week to between 75 and 80 per cent of capacity, with many independent mills fully engaged. Pipe, wire, and structural mills are not keeping up to the general average.

Reports of a general 10 per cent wage advance for steel workers, slated for April 1, have aroused further talk of higher prices for steel. With

increased fuel prices practically assured by the impending wage agreement to be effected on April 1 in the bituminous coal industry, some observers here believe that an early upward adjustment of steel prices is economically imperative.

Pig Iron

Demand continues to be of a minor character. Very little stocking of pig iron is under way, and the movement is almost entirely restricted to small lots for prompt conversion. Second quarter contracting has not yet made any headway. Melt has increased slightly at one or two foundries engaged on railroad orders. Roll makers are becoming more active as a result of export orders, but no noticeable effect on their takings of pig iron has appeared. A merchant stack in this district is expected to be lighted early next month.

Semi-Finished Steel

A fair movement of forging billets and skelp continues. Sustained operations at non-integrated, sheet, strip and tin plate mills are imparting a favorable effect on deliveries of sheet bars. Wire rods are practically neglected.

Bolts, Nuts and Rivets

A moderate amount of contracting for second quarter is reported. Contracts for that period generally stipulate a maximum tonnage, and consumers are, with few exceptions, committing themselves on the same tonnage basis which represented their first quarter requirements. A fairly sizable amount of business from the railroads pends. The New York Central has taken no action on its recent bids. The proposed naval construction program is hailed as an important possible outlet for these products.

Rails and Track Accessories

The Pennsylvania Railroad is taking bids on its second quarter requirements of track spikes, tie plates and other steel products. The New York Central opened bids this week on its second quarter needs of miscellaneous steel products. The latter carrier is expected to act upon bids recently

taken for rails and track accessories. A provision has been filed under the code which proposes an allowance of \$2 a ton, to be made to jobbers of light rails for shipment out of stock. On such deliveries the price would be \$30, Pittsburgh. Direct mill shipments will continue to be billed at the base price of \$32, Pittsburgh.

Bars

Some business is being placed for second quarter, but there is a pronounced indisposition of consumers to commit themselves far ahead. Nevertheless, a definite improvement in demand has occurred during the past week. Interest is rather well spread, although the railroads loom as an important figure in the present market. Several requirement contracts of the carriers for second quarter are nearing the order stage, and some benefit to producers is likely at the turn of the quarter.

Inquiry for reinforcing bars is spreading, probably as a result of seasonal trends in construction. Most new construction work, however, emanates from Government agencies. With the exception of one or two major Government projects, general requirements of reinforcing bars run below 100 tons. Road projects in Pennsylvania account for a large share of reinforcing steel business in this district.

Cold Finished Steel Bars

With fears of a strike allayed in the automotive industry, a slight pick-up in demand for cold-finished bars is noticeable. Interest from the agricultural implement manufacturers is also keener, but producers are not predicting a very encouraging volume of business from that source during the current season. Jobbers are not active in this market.

Wire Products

This market continues to lag behind the other steel products. The slight improvement noticed toward the middle of March is being held, however, and a further pickup may occur if present hopes for seasonal expansion in demand from agricultural areas are realized. Some second quarter business is being covered, but aggregate volume for forward delivery is not significant. The merchant trade is evincing very little interest at present.

Tubular Products

Demand for tubular goods still is spotty. Oil country goods remain the leader in this group, and are moving rather steadily. The improved financial position of some large oil producers has apparently not thus far influenced allocation of funds for tubular goods. However, the gradual financial improvement is expected to be felt by producers of line pipe and oil

country goods before long. Mechanical tubing for the automotive industry leads among the smaller diameter classifications. Boiler tubes are sustained chiefly by railroad demand. Private construction still offers little encouragement for improving demand for standard pipe. The United States Engineer office at Memphis is taking bids on the following welded pipe: 24 sections of 32-in. diameter pipe, 52-ft. lengths and 1/2-in. thickness; 65 sections of 30-in. diameter, 56-ft. lengths, 1/2-in. thickness; 215 sections of 27-in. diameter, 14-ft. lengths, 3/16-in. thickness.

Plates and Shapes

The United States Engineer office at Memphis will open bids on April 5 covering 64 pontoons for the construction of which 1200 tons of plates will be required. On April 13 additional bids will be opened on 50 pontoons, on which plate requirements have not yet been stated. The Memphis office is also taking bids on a dredge hull for which 325 tons of plates will be required. Private barge construction continues to lag. Requirement bids of several railroads include indefinite tonnages of plates for second quarter delivery.

New structural inquiry is featured by a proposed extension to the Wheeling Steel Corp'n. plant at Yorkville, Ohio, for which 1600 tons is specified. Awards for the week were rather restricted.

Sheets

Just prior to settlement of recent labor difficulties in the automotive industry, some sheet producers reported a sharp pickup in new orders. As a consequence, sheet mill operations have maintained their recent average of about 55 per cent of capacity. The lifting of uncertainty in the automobile industry is expected to foreshadow a brisk movement of sheets to that consuming quarter. Miscellaneous demand is considered satisfactory, although aggregate tonnage has not increased.

Tin Plate

Receipt of fairly sizable orders by some producers has tended to offset the recent declining trend in this group. In fact, operations this week will average probably from 75 to 80 per cent. Independent mills are particularly active.

Coal and Coke

Connellsville beehive furnace coke, strictly for shipment on a one-year contract, has been reduced 25c a ton to \$3.25, ovens. For spot delivery or shipment on contract covering less than a one-year period, the price for that grade remains at \$3.50. The reduction on the price applying to one-year contracts has thus far proved no inducement to buyers. Spot demand, however, for both furnace and foundry is fairly brisk. The bituminous coal

market is far from lively, and is likely to remain quiet until navigation on the Great Lakes opens up. A fairly heavy movement of steam, by-product and gas coals is expected to initiate the opening of navigation this season. Slack coal still is difficult to move. A new setup in hours and wages is considered likely to replace the present wage agreement, which expires on April 2. If the present demands of the miners for a shorter work week and a minimum per diem wage are met by operators, bituminous coal prices face inevitable upward revision.

Strip Steel

Business in this market has not lost ground in the past week. Specifications and new orders from the automotive industry are in greater evidence, as is the case with agricultural implement manufacturers. Hot-rolled strip mills are running slightly ahead of cold-rolled strip mills, with the group averaging around 55 per cent.

Scrap

This market has thus far remained impassive to the settlement of the automotive industry's labor troubles. Brokers generally are expectant, however, that some long deferred buying is now due. At least one large consumer, which had been expected to purchase about three weeks ago, is considered an early market prospect. No serious suspensions of shipments have been reported in the past month, and consumers have been using scrap rather steadily. Moreover ingot operations have not receded during that period, and no important replenishment has been reported. Hence the belief is that consumers' stocks are not heavy, and replenishment is urgent in many cases. Based upon these prospects, market sentiment is bright, but prices nevertheless have in most cases remained stationary. Heavy breakable cast scrap is weaker, at 50c. a ton below the previous quotation. Brisker activity among steel casting plants has stimulated a firmer tone in specialties.

Large Pipe Order Placed at St Louis

ST. LOUIS, March 27.—The Board of Public Service has awarded to McClintic-Marshall Corp'n. the contract for electric welded steel pipe for a pressure conduit for the St. Louis Municipal Waterworks at a bid of \$676,277, which was \$106,527 less than the low bid for concrete pipe. The award was made over the protests of labor unions and local contractors, who wanted concrete pipe used because, it was stated, this material would give more employment in St. Louis. The requirements include 46,895 lineal feet of 60-in. pipe, 11,015 lineal feet of 54-in. pipe and 9985

lineal feet of 48-in. pipe, calling for 10,660 tons.

Business in most lines of finished steel is quiet. The falling off in new business and inquiries is attributed partly to the feeling of uncertainty that arose over the automobile labor situation in Detroit.

A fair amount of new business in pig iron was placed during the last week, despite the feeling of concern among melters over the outcome of labor legislation and the recent industrial dispute in the automobile trade.

The scrap market is quiet, with no trading and prices unchanged. The Louisville & Nashville issued a list of 26,000 tons of scrap, but it was withdrawn. Other lists include: Chicago, Burlington & Quincy, 8000 to 9000 tons; Union Pacific, 30 carloads, and Nashville, Chattanooga & St. Louis, 28 carloads.

Heavy Scrap Buying At Buffalo

BUFFALO, March 27.—The heaviest scrap purchasing in years took place last week when the largest consumer in the district decided to offer \$13 for tonnages of No. 1 heavy melting steel and \$11.50 for similar quantities of No. 2. This figure attracted between 20,000 and 25,000 tons of metal from the yards of various dealers. With the 15,000 recently purchased at a price reported to be \$13.50 a week previous, the total purchases for a ten-day period by this interest are between 35,000 and 40,000 tons. Softening of the Pittsburgh and Youngstown markets was largely responsible for the lower price on the last tonnage here.

Foundries display a general interest in pig iron, and are doing some buying in small amounts, but no large purchases have been made. Tonawanda Iron Corp'n. is preparing to blow out its active stack as soon as ore supplies are liquidated.

An award of 350 tons of structural steel for additions to the Eastern States Milling Co., Buffalo, was made to a local fabricator. A new school will call for 350 tons of reinforcing bars. Mill operations are the same as last week.

Detroit Scrap Prices Unchanged

DETROIT, March 27.—Reaction to the automotive labor settlement which was announced less than 48 hr. ago has not yet been sufficiently pronounced to affect scrap prices, which are at the same level as a week ago. A large volume of scrap is coming out of the automobile industry, thereby contributing to a tendency to depress prices.

Operations Hold at 47 Per Cent at Chicago



Railroad Releases Expected to Bolster Production—Impending Steel Wage Advances Point to Higher Prices

CHICAGO, March 27.—Chicago steel producers look for a bulge in steel operations as a result of the increased needs of the railroads. Shipments to automobile plants held well during the strike controversy, and, since there is reason to believe that in recent weeks automobile production has outstripped retail sales, mills do not expect a materially greater tonnage from that source.

Most of the major railroads have now placed orders for rails, but releases are not yet as large as books would allow at this time of year. Unsettled March weather has no doubt held back track work in the Central West and North. Car materials for new equipment and for several sizable repair programs are counted on to bolster steel output. Not much help is to be expected from building construction, but highway bridge work promises to be active this spring.

Ingot output remains at 47 per cent of capacity. Contracting for second quarter up to this moment has remained sluggish. However, with the spread of news that at least some of the units in the steel industry will increase wages, buyers believe that higher prices will follow.

Pig Iron

March shipments of Northern foundry iron will top February by at least 25 per cent. Prices are strong and sales in the last week have mounted sharply as a result, no doubt, of a growing conviction in the minds of users that prices will not long stay at present levels. The Federal furnace is now making iron.

Coke

The movement of foundry coke is strong and March shipments will exceed the February movement by at least 35 per cent, and may reach 40 per cent before the month is out. All reports show that jobbing foundries are melting more iron.

Reinforcing Bars

This market seems unable to gather momentum as spring arrives and shops are not engaged at more than 25 per cent of capacity. Sanitary District, Chicago, tonnages are very slow. Close to 1000 tons of reinforcing bars delivered on this work several years ago but not then used are being

cleaned of rust by CWA workers. A moderate amount of road work is being placed, but it is being split so many ways that individual orders for bars often run as small as a few tons each.

Cast Iron Pipe

Wilmette, Ill., has closed for 900 tons and George Harding, contractor for Georgetown, Ill., is near the point of placing 800 tons. Fresh inquiries are scattered and small sellers, already disappointed at the slowness with which old projects move, have about decided that the spring tonnage must come from Government fund projects, most of which are now defined. Much criticism is heard concerning the slowness with which these projects are being approved at Washington. A small tonnage of pipe has been shipped to Oshkosh, Wis.

Sheets

Movement of this commodity to automobile centers, Nash plants being exceptions, have been undiminished during the period of the strike threat. Now that this controversy has been settled producers look forward to additional buying from this source, although inclined to believe that the peak of automobile production has been reached and that shipments will not climb to materially higher levels. The jobbing trade, fortified with large and well balanced stocks, is quiet, especially in country districts. Caution still marks the attitude of most jobbers. Miscellaneous manufacturers are holding to a fair rate of consumption. Sheet mills in this district are engaged at 65 per cent of capacity.

Rails and Track Supplies

Mills are looking for added business from railroads which are arranging loans for rail purchases. The Great Northern is mentioned as an early buyer of 20,000 tons of rails and 6000 tons of accessories. The Baltimore & Ohio, the New York Central and the Erie are other prospects. The Rock Island, moving cautiously, may come into the market for 5000 tons of rails and the necessary track supplies.

Bars

Shipments are moderately heavier. Acceptances by automobile companies are in unchanged volume, and farm implement manufacturers are holding

all recent gains in operations. Miscellaneous manufacturers are responsible for most of the gain in shipments, among them a prominent industry in and around Chicago, household utilities, which is unmistakably raising its production. Steel furniture manufacturers report gains in business and the bed industry is beginning to gain momentum. Demand for rail steel bars is fairly strong, with mills well engaged. However, most orders are small and economy of operation is a troublesome point at most mills.

Plates

Two public fund projects in the Rocky Mountain region will take over 9000 tons of plates. The largest of these, requiring 8000 tons, consists of tunnel liners for a dam project at Fort Peck, Mont. A syphon at Crede, Colo., will take 1250 tons. It is now learned that the Chicago Great Western has asked for a Government loan to build 500 freight cars. The Van Sweringen car material orders are expected momentarily.

Structural Material

A significant development was the taking of bids last week by the Davis Department Store, Chicago, on an 800-ton store addition. When this project was announced it was said that contracts would be placed only if prices bid were in line with the times. The plans have been shelved, indicating that the Davis store considered prices too high. On the whole, the structural market is quiet.

Wire Products

Shipments are gaining moderately. This gain is from miscellaneous sources and cannot be said to be influenced by automobile manufacturers whose acceptances have been quite steady in the past few weeks. Farm buying in the Middle West is still dragging and the threat of a heavy snowfall may further retard outdoor work. Railroad consumption of wire products remains small. Second quarter contracting has slowed up materially.

Scrap

Prices are still weak, but, in the absence of actual sales to consumers, there is divergence of opinion as to the true market level. Some dealers consider \$12 a ton as the top for heavy melting steel, while others, pointing to the depleted stocks of one prominent mill which has been out of the market for several months, feel certain that the market stands at about \$12.25. A strong influence bearing down on the market is the rapidity with which country scrap dealers accumulated scrap when prices reached the last stages of their recent climb. The result is that there is ample scrap ready to move into Chicago, plus large accumulations of several grades, on a local dock, which do not necessarily have to move from Chicago by boat.

New York District Looks For Wage and Price Rise



Upward Adjustment in Steel Industry
Regarded as Immediate Possibility—
More Railroad Steel Being Placed

NEW YORK, March 27.—The probability of early advances in both steel wages and prices, possibly during the current week, overshadows other market developments. Such action would naturally act as a sharp stimulus to forward covering.

Mills are getting an increasing proportion of their business from the railroads. Close to 60 per cent of the steel required for the cars and locomotives purchased by the Van Sweringen lines has been placed. Although the equipment builders are ordering the steel, in most cases they are placing orders so as to give the purchasing railroads a maximum haul. This usually means that the mills must absorb the freight to meet distant basing point prices and therefore net much less than would normally be the case.

The New York Central takes bids today on its second quarter steel requirements, calling for 10,000 tons of bars, plates and shapes and 550 tons of sheets. It has not yet taken action against tenders received last week on rails and fastenings.

Mason & Hanger Co., Inc., has closed for 5300 to 5550 tons of steel required for the Midtown tunnel. American Bridge Co. was awarded 1300 tons of structural steel, Federal Shipbuilding Corp. was awarded 600 tons of caisson work, Carnegie Steel Co. was given an order for 1250 to 1500 tons of floor beams, and 1300 tons of tie rods went to the Oliver Iron & Steel Co. About 850 tons of concrete bars remain unplaced. McClintic-Marshall Corp. has been awarded 2460 tons of structural steel for a New York State hospital at Brentwood, L. I.

The Gamsu Sheet Metal Works, Inc., Bronx, has been awarded the ventilating contract for the Midtown post office annex calling for 400 tons of galvanized sheets and 150 tons of blue annealed sheets. Generally speaking, sheet bookings have subsided, and tin plate specifications, although still in good volume, are not up to the level of a week or two ago.

Pig Iron

Foundries in this territory are showing the most definite buying in-

terest since the turn of the year. Present commitments, however, generally are not for immediate melting, and the typical disposition seems to favor moderate stock replenishments. Makers of industrial machinery and jobbing concerns were the principal purchasers during the past seven-day period, and aggregate bookings totaled 4300 tons, which compared favorably with the 2500 tons sold in each of the two preceding weekly periods. Most furnace representatives anticipate a substantial increase in total shipments during March as compared with January and February. This indicates better casting schedules as a result of improved business conditions and PWA expenditures.

Reinforcing Steel

A good flow of small orders is reported in this market, but very few actual awards of sizable tonnages have been made. The 800 tons of bars for the Midtown tunnel, New York, will probably be let to Concrete Steel Co. within a week, and Joseph T. Ryerson & Sons, Inc., is expected to divide the final 550 tons for the West Side elevated highway, New York, with National Bridge Works. New inquiries involve about 800 tons for highways and structures for which lettings will be made by Pennsylvania and New Jersey early in April.

Scrap

The widespread reappearance of foreign demand and the settlement of impending strikes have effectively counteracted the price weakness which was evidenced late last week. Brokers' bids on all grades are firm and unchanged, and supplies are being accumulated at numerous points for domestic and foreign mills. The Coatesville, Pa., melter is purchasing good quantities of No. 1 heavy melting steel at \$11, and cast grades and stove plate are being collected for shipment to Phoenixville, Pa. In addition, Bethlehem is actively loading blast furnace and heavy melting steels on barge for future shipment to Buffalo. Practically all foreign countries are inquiring for fresh supplies, and good sales are reported in most cases. A ship is being loaded at a nearby port for Austrian consumption, and shipments have already been made

on a recent Hungarian inquiry covering 40,000 tons of scrap annually. Japan is buying again and English sales have been reported, but Czechoslovakian consumers are not yet inclined to raise their bids to the present market level.

Demand Still Slow At Cincinnati

CINCINNATI, March 27.—The recent labor disturbances in the Detroit area unsettled the entire metal working market here. Demand for pig iron dipped sharply, as consumers withheld second quarter purchases and covered only for urgent requirements. Generally, second quarter business has been unusually light, melters refusing even to inquire for quotations. Furnace interests expect that sales efforts will have to be increased to fill order books for the next three months unless some unforeseen improvement in the melt is forthcoming. Foundries, heretofore in fair operation, have reduced production to a low level, again cutting the melt to meager proportions. Shipments, responding to code contract requirements, have been heavier this month than last, but this is an expected end-of-the-quarter development.

Coke

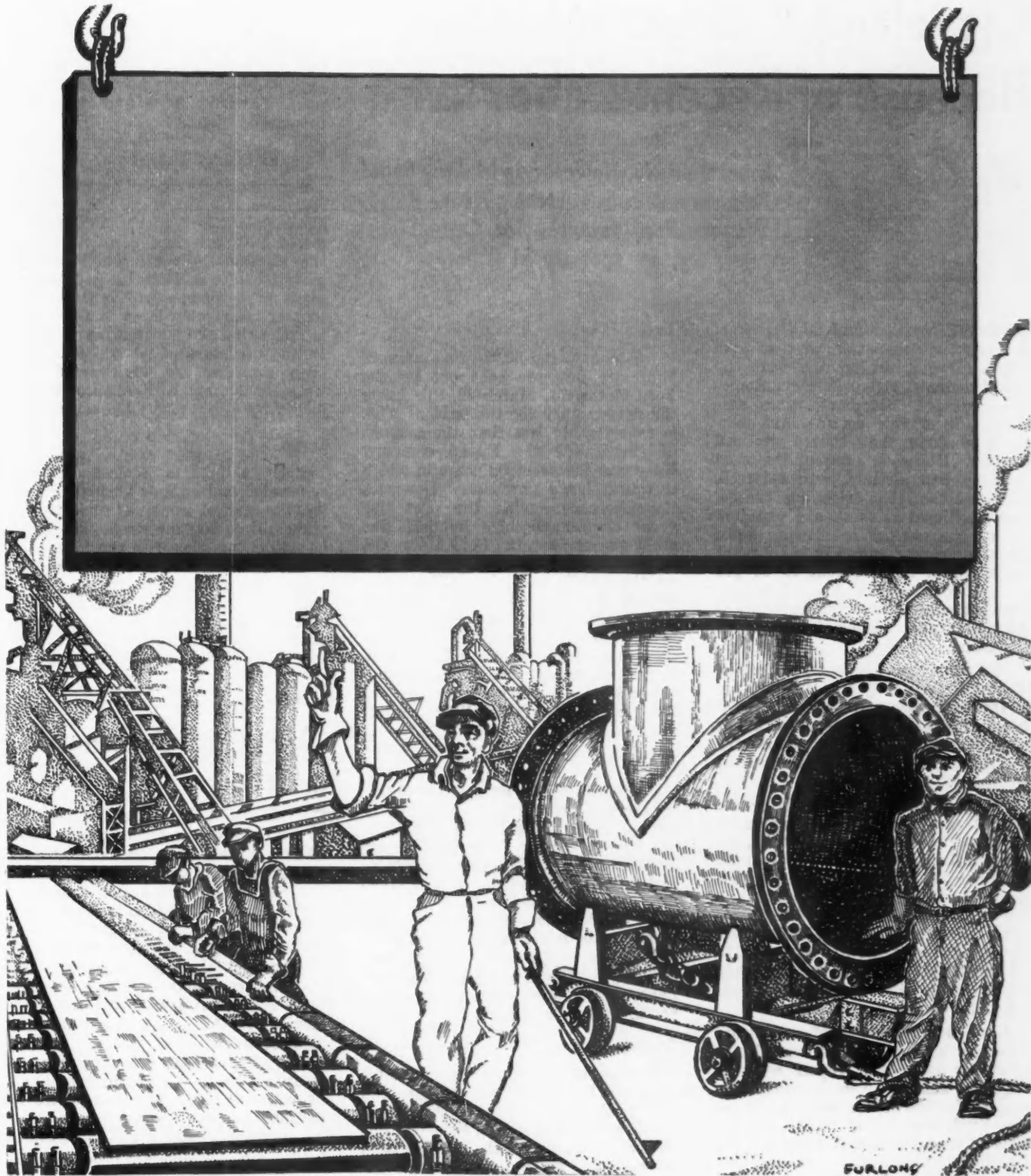
Consumer acceptance of new by-product coke schedules is evidenced by improvement in fuel specifications throughout the district. Shipments had been curtailed beyond March 15 by oven interests, but with prices set, movement of coke again became brisk. Announcement of quotations on domestic grades is withheld to await the settlement of the coal code, the end of this month.

Steel

While no cancellations of sheet orders from the automotive area were recorded during the recent strike scare, a marked hesitancy in accepting shipments was noted. Miscellaneous demand, however, has been steady, accounting for bookings of close to 60 per cent of mill capacity. Current mill operations are on a parity with demand. Business is still cramped, orders extending only a few weeks into the future. In fact, the leading district interest reports that April bookings are still light, substantial business extending only to about the first two weeks in the second quarter.

Scrap

Reflecting the general market uncertainty, scrap is in small demand. New business is meager and shipments are limited to contract requirements. Prices are soft, but unchanged.



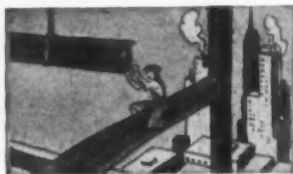
TO THE LETTER



ABLE and experienced personnel, modern, large-capacity sheared and universal mills with complete steel-producing units right at hand to feed them, enable Bethlehem to fill your steel-plate specifications **TO THE LETTER**. Bethlehem Steel Company, General Offices: Bethlehem, Pa.

BETHLEHEM STEEL PLATES

Cleveland Production Down Because of Recent Labor Crisis



Steel Demand, However, Is Making Rapid Recovery — Local Steel Plant Raises Wages—Ford Inquires for Ore—Fluorspar Up \$1

CLEVELAND, March 27.—Demand for finished steel was affected somewhat during the week by the threatened strike in the automotive industry. Shipments were suspended in a few cases and new business from that source declined sharply. However, some of the steel held up has already been released, now that the labor crisis has passed, and additional releases are expected during the week. The slowing down in the demand resulted in a six-point reduction in ingot output to 63 per cent of capacity in the Cleveland-Lorain territory this week, three open-hearth furnaces being taken off in Cleveland.

The Corrigan, McKinney Steel Co. has announced a 10 per cent advance in the hour wage rate effective April 1, and this is regarded as a forerunner of a general advance in the industry and makes more persistent the talk of advances in steel prices.

No specifications for steel for the freight cars for the Van Sweringen railroads have reached the mills, although the car builders have placed contracts for much of the 175,000 tons required. Standard car specifications are being prepared and this has caused delay in issuing releases. However, orders for the steel are expected to be forthcoming in a few days, and this business will help the mill rolling schedules during April.

With the expectation of a good ore shipping season, some demand for steel for Lake boat repair work is expected shortly. The first iron ore inquiry for the season has come from the Ford Motor Co., this being for 50,000 tons of non-Bessemer ore. Reaffirmation of last season's ore prices is expected.

Fluorspar has advanced \$1 a ton. No other price changes are reported.

Pig Iron

Shipments are holding up to recent volume, the strike threat in the automotive industry not having checked the movement. However, sales fell off somewhat during the week, some business being held back pending a clearing up of the labor situation. One leading interest sold 6000 tons, as compared with 8000 tons during each of the two previous weeks.

Iron Ore

An inquiry for 50,000 tons of non-Bessemer ore was sent out by the Ford Motor Co., March 22, this being the first inquiry for the season. This is considerably less than the amount of this grade the Ford company bought in the previous years in which it was a large purchaser. However, its purchases during the past two years were negligible. Inquiries for other grades from the Ford Motor Co. are expected a little later. Quotations on the pending inquiry will not be submitted before about April 15, and this business is likely to establish prices for the season. No changes from last season's prices will be made, in the opinion of some of the leading ore interests, although prices as yet have been given very little consideration.

Sheets

Shipments to the automotive industry were interfered with only slightly by the strike threat. However, little new tonnage came from that source during the week. Mills are maintaining their recent schedules and some are behind on shipments. Demand from jobbing stamping plants in this territory is good, being largely for automotive work. The refrigerator industry continues to take a good tonnage, and demand from stove manufacturers has improved.

Strip Steel

Considerable tonnage of hot-rolled strip was held up by cold rolling mills last week because of the threatened strike in the automotive industry, but part of this tonnage already has been released and further releases are expected before the end of the week. Shipments of both hot and cold strip to automotive consumers were interfered with only in a few cases. However, the unsettled situation resulted in a slackening in new business.

Bolts, Nuts and Rivets

Shipments this month have held up to the February volume, although orders fell off somewhat last week because of the labor situation in the automotive field. Railroad demand is improving. The Illinois Central will require considerable tonnage for car

repair work. Rivets are slightly more active than recently, although orders are not coming from car builders as rapidly as had been expected. Since the reestablishment of prices, a large percentage of buyers have closed contracts for bolts, nuts and rivets for the second quarter.

Bars, Plates and Shapes

Miscellaneous demand for steel bars continues fair. Some good business in automobile forgings covering requirements until July has been diverted to this territory by the recent threat of labor troubles in Detroit. A filtration plant in Columbus will require 2860 tons of reinforcing bars. A Cleveland job requiring 220 tons has been placed. In the structural field 400 tons has been awarded for highway bridge work, including a Kentucky bridge placed by a northern Ohio contractor.

Scrap

With shipments almost entirely suspended and no new business activity, the market remained almost at a standstill during the week. The labor situation, together with the recent inflow of scrap faster than needed, caused the curtailment of movement. However, consumption has not been curtailed and releases are promised by some of the Youngstown district mills this week. Prices are unchanged.

Operations Unchanged In South

BIRMINGHAM, March 27.—The nearness of the second quarter has had no marked effect on the buying of pig iron. Last week's placements of forward tonnage were an improvement, but no substantial buying movement has developed. There has been a slow but gradual accumulation of tonnage for the next quarter. The iron-clad contracts of the code have made buyers cautious in their commitments. At the same time they are also ordering close to their actual needs. The market also lacks a price incentive, as no changes in quotations have been made. The base price is \$13.50.

Ten furnaces are in blast, no change having taken place since late January.

Steel

Since all first quarter prices have been reaffirmed for the second quarter, steel buyers are in no rush to anticipate their requirements of the next three months. Demand for the lighter products has been holding at a fairly steady rate. Orders for plates and shapes vary from week to week, dependent mostly on awards of road contracts and other Government work.

Thirteen open-hearths were worked last week.

Orders From Railroads Boost Philadelphia District Output



Ingot Production Rises to 36 Per Cent of Capacity—Labor Troubles Are Depressing Influence—Wages to Be Advanced

PHILADELPHIA, March 27.—Demand for finished steel products in this district was not seriously influenced by labor trouble in the automobile industry and consequently business has not improved materially because of the satisfactory settlement. In fact, the labor situation locally is not so favorable. Although the strike in the plant of the Budd Mfg. Co. has finally been terminated, the New York Shipbuilding Co. at Camden, N. J., has been forced to halt operations even though it happens to have particularly large orders on its books.

Orders from the railroads are giving the market its chief support. The Pennsylvania has increased its releases against recent contracts and took bids yesterday on its second quarter requirements for plates, shapes, bars and sheets. A number of the bids have been returned to the mills for revision to conform with Commercial Resolution No. 54 of the steel code. The Boston & Maine has placed 30,000 tons of rails and necessary track supplies, the rails going to the Bethlehem Steel Co. The Norfolk & Western is taking Clayton Act bids this week on 4500 tons of bars, plates and shapes for second quarter. The road ordinarily inquires for only 2500 tons. The Baltimore & Ohio is placing business regularly for car repairs and will soon buy rails and track accessories. The Seaboard Air Line is also expected to place 500 freight cars in the near future and will require steel for repair purposes.

Steel ingot production in the district has risen two points to 36 per cent of capacity. The leading interest is running at a somewhat higher rate, with independents maintaining recent schedules. Mills in the district are planning to advance wages 10 per cent, effective April 1, in line with action taken today by a Cleveland mill. This action has revived talk of price increases, and higher quotations on flat-rolled steel products are now considered a certainty.

Pig Iron

The prospect of higher wages has again brought up the talk of increased pig iron prices, but producers are not in agreement as to the probable course of action. Wages represent but a small part of the cost of making pig iron and current levels are

thought to be high enough by some makers. Demand is gradually improving, but large interests still show no disposition to make forward commitments.

Bars, Plates and Shapes

Reinforcing bars are more active, but the structural steel market remains quiet. The Rust Engineering Co., Pittsburgh, was apparently low bidders on the Government airport at Middletown, Pa., which will require 3000 tons of shapes. The plate market is featured by second quarter inquiries from the railroads on which bids are being opened this week. The Pennsylvania's requirements are undetermined, but this road is releasing steel more freely for its car building program. The Baltimore & Ohio, the

Seawall Bar Tonnage Up for Bids on Coast

SAN FRANCISCO, March 26.—At Seattle, Wash., bids have been called for 1012 tons of reinforcing bars for the Railway Avenue seawall. Although the general contract has been awarded for piers for the Grand Coulee bridge in Washington the 270 tons of bars have not as yet been placed. Los Angeles will take bids on two bridges on Gaffy Avenue which will require 400 tons of reinforcing bars, and a dam at San Diego, Cal., calls for 260 tons of bars.

An additional 1100 tons of structural steel are reported to have been included in the award made to the United States Steel Products Co. for radio towers at Pearl Harbor, T. H., and Summit, C. Z., making a total of 4600 tons. Isacson Iron Works took 100 tons of structural steel for a natatorium at Seattle, Wash. At Los Angeles, Cal., the Concrete Engineering Co. was awarded 333 tons of reinforcing bars for two State bridges, while Truscon Steel Co. took 150 tons for a County Medical Association library. Approximately 245 tons of bars for State bridges in Santa Barbara County, Cal., were booked by Blue Diamond Corp. Soule Steel Co. took 200 tons of trusses for a dormitory at Stanford University. A reward of 100 tons of plates for boil-

Norfolk & Western and the Seaboard Air Line are among the carriers which are placing or about to place business. A strike in the plant of a large shipbuilding company in the district may hold up shipments. The company had recently begun construction of two large oil tankers and has heavy Navy awards on its books.

Sheets

Demand shows little change, but impetus to second quarter contracting is expected to be offered by the expectation of a price advance on flat-rolled steel products. With wages going up, higher sheet and strip prices have become a practical certainty. Automotive demand is well sustained, but the leading body builders in the district have made no recent purchases. Miscellaneous orders continue rather light.

Scrap

This market has grown no weaker in the last few days and a small sale of No. 1 heavy melting steel at \$12 has given the market some strength. However, other consumers are showing no interest and could probably pick up distress scrap at \$11.50. The market on No. 2 steel is being sustained by export demand, although a nearby consumer is paying only \$9.50. Stove plate is weaker, with dealers offering only \$9.

ers at the Navy Yard at Mare Island, Cal., was made to R. G. Meyler Corp.

Lettings for the week were confined to 1520 tons of structural steel and 1247 tons of reinforcing bars. New projects aggregated 1082 tons of structural, 2308 tons of reinforcing and 725 tons of plates.

Pig Iron Sales Gain Slightly at Boston

BOSTON, March 27.—Slightly larger pig iron sales are reported, the aggregate of 1500 tons being the largest noted in some weeks. Sales included 200 tons of malleable and 600 tons of foundry for a Providence, R. I., melter. It is reported the Providence buyer took part Buffalo and part Dutch iron. A Springfield, Mass., inquiry for 100 to 300 tons remains uncovered. There are no other round tonnage inquiries in the market.

With no new buying orders issued by steel mills, and old ones virtually completed, scrap prices, to a large extent, are purely nominal. Were it not for light buying of No. 1 steel at \$8.50 a ton delivered locally and No. 2 steel at \$7.50 for barge shipments to eastern Pennsylvania, and takings of a few carlots of steel turnings for Pittsburgh district delivery at \$4 a ton on cars, business would be at a standstill. New England steel mill operations are unchanged from last week.

Tin Price Marked by Steady Advances; Further Increases Expected in London

Spelter Offerings Weak at 4.32½c. Despite Unchanged Ore Price—Copper Market Inactive—Lead in Good Demand

NEW YORK, March 27.—The electrolytic copper market is dull and uncertain as codification discussions continue, and consumers are not expected to abandon their present buying reserve until they know definitely what restrictions will be adopted by the industry. The trade welcomed the announcement of a 16,000-ton stock decrease in February, but there is considerable doubt as to whether the decrease indicates any sizable expansion in consumption. Over 500,000 tons of unwanted metal still overhangs the market, and, in addition, fabricators have over 200,000 tons of stocks. This poor statistical position is the principal cause of code difficulties. The various aspects of the code are still being discussed, and Anaconda is leading the fight against certain suggested provisions. There is no doubt but that a code will finally be drafted and accepted, but whether

a minimum market price will be established or how sales and production quotas will be regulated is still undecided.

American interests continue to sell good tonnages abroad at prices 10 to 20 points above the domestic market. Sentiment in Europe has been greatly assisted by the report of a stock decrease here and an expected improvement of demands for munitions purposes.

Tin

Sales have been in good volume throughout the week as consumers cautiously bought forward requirements on a rising market. Straits and English brands were priced this morning in New York at 54.45c. a lb., and postings in England were approximately £4 higher at £238 17s. 6d. and £236 17s. 6d. for spot and future standard respectively, and £242 10s.

for Straits at Singapore. The price buoyancy now in evidence is a reflection of bullish sentiment abroad occasioned by steadily declining stocks. Dealers are holding a considerable supply of tin in New York warehouses which obviates any danger of a shortage of prompt metal. Nevertheless, the tendency of the backwardation to substantially advance in England is indicative of an opinion that a tight metal situation is expected before output restrictions are liberalized and additional supplies reach the market.

Lead

Quotations remain unchanged and firm, and day-to-day purchases are satisfactory in volume. All consuming outlets are asking for metal, but, so far, most commitments have designated prompt deliveries, and there is very little disposition to cover far forward even at the desirable 4c. price. March deliveries will exceed 30,000 tons, whereas April bookings now aggregate only 15,000 tons, which indicates that well over 15,000 tons of business is yet to be done. Most of the present activity is for April, and a few May tonnages have been booked, although that month won't be officially available until next week. February deliveries declined to 25,778 tons, but production curtailments were sufficient to confine the stock increase to 8550 tons. Present production is lower than the average for February, and the trade hopes for a slight stock decrease during March.

Zinc

Although Joplin concentrates are firm at \$30, spelter quotations eased downward during the week, and all market requirements are now being covered at 4.32½c. a lb., East St. Louis, for deliveries into May. Important sellers are asking 4.35c. for June metal, but the price is almost nominal as consumers are confining purchases to cover nearby needs. There is little competitive inquiry in this market, and the weak condition of Prime Western at 4.32½c. is attributed to the absence of usual seasonal demands from the galvanizing industry. Aggregate bookings last week amounted to 2000 tons, mostly spot at 4.35c., which compares with 2000 tons in the preceding period, and 2770 tons sold two weeks ago. Most smelter representatives contend that \$30 ore cannot be profitably converted at 4.32½c., and therefore they are somewhat discouraged by the probability of a ruling 4.30c. figure in the near future. It is doubtful whether real consumptive demands will very soon materially expand, and the only other possibility for a more equitable condition is that Tri-State miners will offer ore at a lower figure in order to accelerate sales. Ore production last week rose to 6750 tons, but smelters purchased only 1400 tons. About 5700 tons was shipped, and visible stocks are currently estimated at 13,150 tons.

The Week's Prices. Cents Per Pound for Early Delivery

	March 21	March 22	March 23	March 24	March 26	March 27
Electrolytic copper, N. Y.*	7.75	7.75	7.75	7.75	7.75	7.75
Lake copper, N. Y.	8.00	8.00	8.00	8.00	8.00	8.00
Straits tin, Spot, N. Y.	54.10	54.25	54.30	54.30	54.62½	54.45
Zinc, East St. Louis.	4.37½	4.35	4.35	4.35	4.32½	4.32½
Zinc, New York.	4.72½	4.70	4.70	4.70	4.67½	4.67½
Lead, St. Louis.	3.90	3.90	3.90	3.90	3.90	3.90
Lead, New York.	4.00	4.00	4.00	4.00	4.00	4.00

*Refinery quotations; price ¼c. higher delivered in Connecticut.

Aluminum, 98-99 per cent, 22.90c. a lb. delivered.
Aluminum, remelt No. 12 (alloy), carload lots delivered, 16c. a lb., average for week.
Nickel electrolytic cathode, 35c. a lb., delivered; shot and ingot, 36c. a lb., delivered.
Antimony, 7.60c. a lb., New York.
Brass ingots, 85-5-5-5, 8.25c. a lb., New York and Philadelphia.

From New York Warehouse

Delivered Prices, Base per Lb.

Tin, Straits pig.	55.50c. to 56.50c.
Tin, bar	57.50c. to 58.50c.
Copper, Lake	9.75c. to 10.50c.
Copper, electrolytic	9.50c. to 10.00c.
Copper, castings	9.25c. to 10.25c.
*Copper sheets, hot-rolled	15.00c.
*High brass sheets	13.75c.
*Seamless brass tubes	16.25c.
*Seamless copper tubes	16.25c.
*Brass rods	12.25c.
Zinc slabs	5.75c. to 6.75c.
Zinc sheets (No. 9), casks, 1200 lb. and over	10.25c.
Lead, American pig	4.75c. to 5.75c.
Lead, bar	5.75c. to 6.75c.
Lead, sheets	7.75c.
Antimony, Asiatic	9.00c.
Alum., virgin, 99 per cent, plus	22.30c.
Alum., No. 1 for remelting, 98 to 99 per cent	18.00c. to 19.00c.
Solder, ½ and ½	33.00c. to 34.00c.
Babbitt metal, commercial grades	25.00c. to 60.00c.

*These prices are also for delivery from Chicago and Cleveland warehouses.

From Cleveland Warehouse

Delivered Prices per Lb.

Tin, Straits pig.	59.00c.
Tin, bar	61.00c.

Copper, Lake	9.00c.
Copper, electrolytic	9.00c.
Copper, castings	8.75c.
Zinc, slab	5.75c. to 6.00c.
Lead, American pig	5.00c. to 5.25c.
Lead, bar	8.00c.
Antimony, Asiatic	9.00c.
Babbitt metal, medium grade	19.50c.
Babbitt metal, medium grade	64.00c.
Solder, ½ and ½	35.25c.

Old Metals, Per Lb., New York

Buying prices are paid by dealers for miscellaneous lots from smaller accumulators, and selling prices are those charged to consumers after the metal has been prepared for their uses. (All prices are nominal.)

	Dealers' Buying Prices	Dealers' Selling Prices
Copper, hvy. crucible	6.50c.	7.25c.
Copper, hvy and wire	6.25c.	7.00c.
Copper, light and bottoms	5.25c.	6.25c.
Brass, heavy	3.50c.	4.25c.
Brass, light	3.00c.	3.625c.
Hvy. machine composition	4.75c.	5.625c.
No. 1 yel. brass turnings	4.25c.	5.125c.
No. 1 red brass or compos. turnings	4.25c.	5.25c.
Lead, heavy	3.00c.	3.625c.
Zinc	2.50c.	3.125c.
Cast aluminum	9.50c.	11.25c.
Sheet aluminum	12.25c.	13.50c.

Cast Iron Pipe

Wilmette, Ill., has ordered 900 tons of 24-in. from Lynchburg Foundry Co.

McLean, Ill., has opened bids on 250 tons.

Catlin, Ill., has opened bids on 250 tons.

Cincinnati will open bids April 3 on 75,400 ft. of 6 to 12-in.

Burgaw, N. C., plans water pipe line system. Fund of \$48,000 is being secured through Federal aid for this and waterworks station.

Miami, Fla., asks bids until April 18 for about 57,000 ft. of 18, 24, 30 and 36-in. for water supply. Fund of \$560,000 has been arranged for this and other waterworks expansion.

New Braunfels, Tex., plans water pipe line system, including main trunk and distribution mains. Fund of \$7,650,000 is being arranged through Federal aid for project.

Jacksonville, Fla., plans water pipe line extensions. Cost about \$14,000. W. E. Sheddan is city engineer.

Trenton, Mo., plans water pipe line extensions. Fund of \$32,200 is being arranged for this and other waterworks improvements. Burns & McDonnell Engineering Co., 107 Linwood Boulevard, Kansas City, Mo., is engineer.

Royal, Iowa, plans about two miles of 6-in., with number of 4-in. distributing lines for water supply, with elevated steel tank and tower. Buell & Winter Engineering Co., Insurance Exchange Building, Sioux City, Iowa, is engineer.

Choteau, Mont., plans about 12,600 ft. of 6-in., for water supply. Special election is called for April 6 to authorize fund of \$25,000 for water system extension and improvements.

Maplewood Water District of Multnomah County, Wash., has taken bids on 11,000 ft. of 6-in. and smaller.

Roseville, Cal., closes bids in April for pipe and other equipment for water supply system. Baar & Cunningham, Spaulding Building, Portland, Ore., are consulting engineers.

Morgan Hill, Cal., has awarded 360 tons of 4 to 8-in. to American Cast Iron Pipe Co.

Laguna Beach, Cal., has awarded 130 tons of 4 to 16-in. to United States Cast Iron Pipe Co.

Oakland, Cal., has placed 120 tons of 4-in. with United States Cast Iron Pipe Co.

Salem, Ore., plans main trunk line for water supply from Little North Fork of Santiam River, and several new distributing lines. Fund of \$2,500,000 is being arranged through Federal aid for new waterworks, including two reservoirs. Baar & Cunningham, Spaulding Building, Portland, are engineers.

Pipe Lines

Industrial Natural Gas Pipe Line Co., recently organized interest of Michigan Natural Gas Corp., Mount Pleasant, Mich., plans 240-mile welded steel pipe line from central Michigan gas fields to points near Detroit, Flint and Pontiac, Mich., for industrial purposes. Cost \$4,500,000 including compressor plants along route. A. E. Butterfield, Mount Pleasant, is one of heads of parent company.

Middleport, Ohio, plans steel pipe line for gas transmission and distribution. Cost about \$175,000. Financing is being arranged through Federal aid. J. E. Harley, mayor, is active in project.

Natural Gas Service Corp., Jackson, Miss., plans welded steel pipe trunk line in central part of State, totaling 8209 miles, with distributing lines in different municipalities. Installation will include compressor plants and about 195,000 gas meters. Application has been made for Federal loan for \$144,000,000 for project.

Austin, Minn., plans steel pipe line for gas transmission and distribution. Black & Veatch, Mutual Building, Kansas City, Mo., consulting engineers, will make surveys and estimates of cost.

Mine & Smelter Supply Co., Denver, has been awarded contract for 10,000 ft. of 16-in. steel pipe by Boulder, Colo., for trunk line water supply.

BUNDYWELD STEEL TUBING *is* COPPER-COATED *inside and outside*

Bundyweld Steel Tubing is rolled from strip steel which has been previously copper-coated on two sides, and is then Copper-Hydrogen-Electric-Welded into a solid structure. This copper coating gives Bundyweld Tubing very desirable corrosion-resisting properties. Because of its ability to withstand vibration, its great strength, and recuperative properties, it has been proven superior for such installations as gas, oil, brake, and vacuum lines. It has the strength of steel with sufficient ductility to permit easy fabrication.

The reducing atmosphere of the welding process leaves the tube absolutely clean and free from scale. It may be heat-treated without injury.

Both I. D. and O. D. are held to tolerances of .003". Uniformity of wall thickness is an outstanding feature. Bundyweld tubing is furnished in base sizes of $\frac{3}{16}$ ", $\frac{1}{4}$ ", $\frac{5}{16}$ ", $\frac{3}{8}$ ", $\frac{7}{8}$ ", $\frac{1}{2}$ ", and $\frac{3}{4}$ " in various wall thicknesses. It can be redrawn to any odd size required. Furnished in lengths or completely fabricated, either with or without fittings. Send blue prints or samples for quotations. Complete information upon request.

BUNDY TUBING CO. DETROIT

Prices of Finished and Semi-Finished Steel, Coke, Coal, Cast Iron Pipe

BARS, PLATES, SHAPES

Iron and Steel Bars	
Soft Steel Base per Lb.	
F.o.b. Pittsburgh mill	1.75c
F.o.b. Chicago or Gary	1.80c
Del'd Philadelphia	2.04c
Del'd New York	2.08c
F.o.b. Cleveland	1.80c
Del'd Detroit	1.85c
F.o.b. Buffalo	1.90c
F.o.b. Birmingham	1.90c
F.o.b. cars dock Pacific ports	2.30c
F.o.b. cars dock Gulf ports	2.15c

Rail Steel	
(For merchant trade)	
F.o.b. Cleveland	1.70c
F.o.b. Chicago	1.70c
F.o.b. Gary	1.70c
F.o.b. Pittsburgh	1.70c
F.o.b. Buffalo	1.75c
F.o.b. Birmingham	1.80c

Billet Steel Reinforcing	
(Cut lengths as quoted by distributors)	
F.o.b. P'gh mills	1.90c
F.o.b. Birmingham	1.95c
F.o.b. Buffalo	1.95c
F.o.b. Cleveland	1.95c
Del'd Detroit	2.05c
F.o.b. Youngstown	1.95c
F.o.b. cars dock Pacific ports	2.35c
F.o.b. cars dock Gulf ports	2.30c
F.o.b. Chicago	1.95c

Rail Steel Reinforcing	
(Cut lengths as quoted by distributors)	
F.o.b. Pittsburgh	1.75c
F.o.b. Cleveland	1.80c
F.o.b. Chicago	1.80c

Iron	
Common iron, f.o.b. Terre Haute, Ind.	1.60c to 1.75c
Refined iron, f.o.b. P'gh mills	2.75c
Common iron, del'd Philadelphia	1.80c
Common iron del'd New York	1.95c

Steel Car Axles	
F.o.b. Pittsburgh	2.50c
F.o.b. Chicago	2.50c

Tank Plates	
Base per Lb.	
F.o.b. Pittsburgh mill	1.70c
F.o.b. Chicago	1.75c
F.o.b. Gary	1.75c
F.o.b. Birmingham	1.85c
Del'd Cleveland	1.885c
Del'd Philadelphia	1.885c
F.o.b. Coatesville	1.80c
Del'd Sparrows Point	1.80c
Del'd New York	1.98c
F.o.b. cars dock Pacific ports	2.10c
F.o.b. cars dock Gulf ports	2.10c
Wrought iron plates, f.o.b. P'gh	3.00c

Floor Plates	
F.o.b. Pittsburgh	3.20c
F.o.b. Chicago	3.25c

Structural Shapes	
Base per Lb.	
F.o.b. Pittsburgh mill	1.70c
F.o.b. Chicago	1.75c
F.o.b. Birmingham	1.85c
F.o.b. Buffalo	1.80c
Del'd Cleveland	1.80c
Del'd Philadelphia	1.85c
Del'd New York	1.9525c
F.o.b. cars dock, Gulf ports	2.10c
F.o.b. cars dock cars Pacific ports (standard)	2.25c
F.o.b. cars dock cars Pacific ports (wide flange)	2.35c

Steel Sheet Piling	
Base per Lb.	
F.o.b. Pittsburgh	2.00c
F.o.b. Chicago mill	2.10c
F.o.b. Buffalo	2.10c
F.o.b. cars dock Gulf ports	2.45c
F.o.b. cars dock Pacific ports	2.45c

Alloy Steel Bars	
F.o.b. Pittsburgh, Chicago, Buffalo, Bethlehem, Massillon or Canton	
Open-hearth grade, base, 2.45c, a lb. except at Bethlehem where the price is 2.55c. Delivered price at Detroit is 2.60c.	
S.A.E.	

Alloy	
Series Numbers	
3000 (1/4% Nickel)	Differential per 100 lb. \$0.25
3100 (2 1/4% Nickel)	0.55
3300 (3 1/4% Nickel)	1.50
3500 (5% Nickel)	2.25
3100 Nickel Chromium	0.55
3200 Nickel Chromium	1.35
3300 Nickel Chromium	3.80
3400 Nickel Chromium	3.20
4100 Chromium Molybdenum (0.15 to 0.25 Molybdenum)	0.50
4100 Chromium Molybdenum (0.25 to 0.40 Molybdenum)	0.70
4600 Nickel Molybdenum (0.20 to 0.30 Molybdenum) (1.50 to 2.00 Nickel)	1.05
6100 Chromium Steel (0.60 to 0.90 Chromium)	0.35
6100 Chromium Steel (0.80 to 1.10 Chromium)	0.45
6100 Chromium Spring Steel	base
6100 Chromium Vanadium Steel	1.20
4100 Chromium Vanadium Spring Steel	0.95
Chromium Nickel Vanadium	1.50
Carbon Vanadium	0.95

Above prices are for hot-rolled steel bars. The differential for most grades in electric furnace steel is 50c. higher. The differential for cold-drawn bars is 1/4c. per

lb. higher with separate extras. Blooms, billets and slabs under 4 1/2 in. or equivalent are sold on the bar base. Slabs with a section area of 15 in. and 2 1/2 in. thick or over take the billet base. Sections 4 1/2 in. to 10 1/2 in. or equivalent carry a gross ton price, which is the net price for bars for the same analysis. Larger sizes carry extras.

Cold Finished Bars*	
Base per Lb.	
Bars, f.o.b. Pittsburgh mill	2.10c
Bars, f.o.b. Chicago	2.15c
Bars, Cleveland	2.15c
Bars, Buffalo	2.20c
Bars, Detroit	2.30c
Bars, eastern Michigan	2.35c
Shafting, ground, f.o.b. mill,	
1/2 in. 3/16 to 1 1/2 in.	2.90c
1-9/16 to 1 1/2 in.	2.75c
1-15/16 to 2 1/2 in.	2.60c
2-15/16 to 6 in.	2.45c

* In quantities of 10,000 to 10,000 lb.

SHEETS, STRIP, TIN PLATE

TERNE PLATE	
Sheets	
Hot Rolled Base per Lb.	
No. 10, f.o.b. Pittsburgh	1.75c
No. 10, f.o.b. Gary	1.85c
No. 10, del'd Detroit	1.95c
No. 10, del'd Phila.	2.04c
No. 10, f.o.b. Birmingham	1.90c
No. 10, f.o.b. dock cars Pacific	2.42 1/2 c.

Hot-Rolled Annealed	
No. 24, f.o.b. Pittsburgh	2.25c
No. 24, f.o.b. Gary	2.35c
No. 24, del'd Detroit	2.45c
No. 24, del'd Phila.	2.54c
No. 24, f.o.b. Birmingham	2.40c
No. 24, f.o.b. dock cars Pacific	2.95c
No. 24, wrought iron, Pittsburgh	4.30c

Heavy Cold-Rolled	
No. 10 gage, f.o.b. Pittsburgh	2.30c
No. 10 gage, f.o.b. Gary	2.40c
No. 10 gage, del'd Detroit	2.50c
No. 10 gage, del'd Phila.	2.59c
No. 10 gage, f.o.b. dock cars Pacific	3.00c

Light Cold-Rolled	
No. 20 gage, f.o.b. Pittsburgh	2.75c
No. 20 gage, f.o.b. Gary	2.85c
No. 20 gage, del'd Detroit	2.95c
No. 20 gage, del'd Phila.	3.04c
No. 20 gage, f.o.b. dock cars Pacific	3.45c

Galvanized Sheets	
No. 24, f.o.b. Pittsburgh	2.85c
No. 24, f.o.b. Gary	2.95c
No. 24, del'd Phila.	3.14c
No. 24, f.o.b. Birmingham	3.00c
No. 24, f.o.b. dock cars Pacific	3.55c
No. 24 Wrought iron, Pittsburgh	4.95c

Long Ternes	
No. 24, unassorted 8-lb. coating	f.o.b. Pittsburgh 3.25c
No. 20, f.o.b. Pittsburgh	2.90c

Vitreous Enameling Stock	
No. 28, f.o.b. Pittsburgh	2.65c
No. 28, Gary	2.75c

Tin Mill Black Plate	
Standard cokes, f.o.b. P'gh district	\$5.25
Standard cokes, f.o.b. Gary	5.35
Standard cokes, f.o.b. cars dock	5.90

Terne Plate	
(Per Package, 20 x 28 in.)	
8-lb. coating I.C.	\$10.00
15-lb. coating I.C.	12.00
20-lb. coating I.C.	13.00
25-lb. coating I.C.	14.00
30-lb. coating I.C.	15.25
40-lb. coating I.C.	17.50

Hot-Rolled Hoops, Bands, Strips and Flats under 1/4 in.	
Base per Lb.	
All widths up to 24 in., P'gh	1.75c
All widths up to 24 in., Chicago	1.85c
All widths up to 24 in., del'd Detroit	1.95c
Cooperage stock, Pittsburgh	1.85c
Cooperage stock, Chicago	1.95c

Cold-Rolled Strips	
F.o.b. Pittsburgh	2.40c
F.o.b. Cleveland	2.40c
Del'd Chicago	2.68c
F.o.b. Worcester	2.60c

Fender Stock	
No. 20, Pittsburgh or Cleveland	3.10c

WIRE PRODUCTS

To Manufacturing Trade	
Per Lb.	
Bright wire	2.20c
Spring wire	3.20c

To Jobbing Trade	
Extras of 10c. a 100 lb. on joint carloads and 30c. on pooled cars and less-than-carload lots are applied on all merchant wire products. An allowance of \$2 a ton is made to jobbers on straight, mixed or joint carloads; \$3 a ton is allowed on less-than-carload shipments.	

Base per Keg	
Standard wire nails	\$2.35
Smooth coated nails	2.35
Galvanized nails:	
15 gage and coarser	4.35
16 gage and finer	4.85

Base per 100 Lb.	
Smooth annealed wire	\$2.35
Smooth galvanized wire	2.70
Polished staples	3.05
Galvanized staples	3.30
Barbed wire, galvanized	2.85
Woven wire fence, base column	60.00

Chicago and Anderson, Ind., mill prices are \$1 a ton over Pittsburgh base (on all products except woven wire fence, for which the Chicago price is \$2 above Pittsburgh); Duluth, Minn., and Worcester, Mass., mill prices are \$2 a ton over Pittsburgh (except for woven wire fence at Duluth which is \$3 over Pittsburgh), and Birmingham mill prices are \$3 a ton over Pittsburgh.

STEEL AND WROUGHT PIPE AND TUBING

Welded Pipe

Base Discounts, f.o.b. Pittsburgh District and Lorain, Ohio, Mills

Steel	
Inches	
1/2 to 3/4	57 38 1/2
3/4 to 1	62 50 1/2
1 to 1 1/2	65 55 1/2
1 1/2 to 2	67 58 1/2

Wrought Iron	
Inches	
1/2 to 3/4	57 38 1/2
3/4 to 1	62 50 1/2
1 to 1 1/2	65 55 1/2
1 1/2 to 2	67 58 1/2

Lap Weld	
2 to 3	63 54 1/2
3 to 4	66 57 1/2
4 to 5	68 59 1/2
5 to 6	70 61 1/2
6 to 8	72 63 1/2
8 to 10	74 65 1/2
10 to 12	76 67 1/2

Butt Weld, extra strong, plain ends	
1/2 to 3/4	61 33 1/2
3/4 to 1	64 41 1/2
1 to 1 1/2	66 51 1/2
1 1/2 to 2	68 58 1/2

Lap Weld, extra strong, plain ends	
1/2 to 3/4	61 33 1/2
3/4 to 1	64 41 1/2
1 to 1 1/2	66 51 1/2
1 1/2 to 2	68 58 1/2

Discounts on steel and wrought iron pipe are net and not subject to any points or preferentials.

Note—Chicago district mills have a base two points less than the above discounts. Freight is figured from Pittsburgh, Lorain, Ohio, and Chicago district mills, the billing being from the point producing the lowest price to destination.

Boiler Tubes

Base Discounts, f.o.b. Pittsburgh

Steel	
2 in. and 2 1/2	33
2 1/2 to 3 in.	40
3 in. to 3 1/2	44
3 1/2 to 4 in.	47
4 in. to 4 1/2	49
4 1/2 to 6 in.	42

Charcoal Iron	
1 1/2 in.—1 3/4 in.	44
2 in.—2 1/2 in.	43
2 1/2 to 3 in.	45
3 in. to 3 1/2	47
3 1/2 to 4 in.	49
4 in. to 4 1/2	51

On lots of a carload or more the above base discounts are subject to a preferential of two fives on steel and of 10 per cent on charcoal iron tubes. Smaller quantities are subject to the following modifications from the base discounts:

Lap welded steel—Under 10,000 lb., 6 points under base and one five; 10,000 lb. to carload 4 points under base and two fives. Charcoal iron—Under 10,000 lb., 2 points under base; 10,000 lb. to carload, base and one five. Exception: On 1 1/2 to 1 3/4-in. charcoal iron tubes no supplementary discounts are granted, and the discount for 10,000 lb. to a carload is 4 points under base and for less than 10,000 lb. 8 points under base.	
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Standard Commercial Seamless Boiler Tubes

Cold-Drawn	
1 in.	68
1 1/4 to 1 1/2 in.	68
1 1/2 in.	68
2 to 2 1/2 in.	27
2 1/2 to 3 in.	34

Hot-Rolled	
2 and 2 1/2 in.	33
2 1/2 to 3 in.	40
3 in.	44
3 1/2 to 4 in.	47
4 in.	49
4 1/2 to 6 in.	42

In the case of all sizes except 1-in. to 1 1/4-in. cold-drawn boiler tubes supplementary discounts of two 5 per cents are allowed on carload lots. On quantities up to 10,000 lb. the base discount is reduced 10 points and a supplementary discount of 5 per cent only is allowed. On quantities 10,000 lb. to 24,999 lb. the base discount is reduced 6 points and a supplementary discount of 5 per cent only is allowed. On 25,000 lb. to a carload the base discount is reduced 2 points and supplementary discounts of two 5 per cents are allowed.

On 1 to 1 1/4-in. cold-drawn boiler tubes, there are no supplementary discounts. On quantities up to 10,000 lb. the base discount is reduced 12 points; on 10,000 lb. to 24,999 lb., it is reduced 8 points; on 25,000 lb. to a carload it is reduced 3 points.

Seamless Mechanical Tubing

Carbon, 0.10% to 0.30% base (carloads) 55
Carbon, 0.30% to 0.40% base (carloads) 54
Plus differential for lengths over 18 ft. and for commercial exact lengths. Warehouse discounts on small lots are less than the above.

RAILS AND TRACK SUPPLIES

F.o.b. Mill	
Standard rails, 60-lb. and heavier, per gross ton	\$36.37 1/2
Angle bars, per 100 lb.	2.55

F.o.b. Code Basing Points

Light rails (from billets) per gross ton	\$39.04
Light rails (from rail steel) per gross ton	31.00

Base per 100 Lb.	
Spikes, 9/16 in. and larger	\$2.40
Spikes, 1/2 in. and smaller	2.40
Spikes, boat and barge	2.40
Tie plates, steel	1.90
Track bolts, to steam railroads	3.55
Track bolts, to jobbers, all sizes (per 100 count)	1.61

BOLTS, NUTS, RIVETS AND SET SCREWS

Base and Nuts

(F.o.b. Pittsburgh, Cleveland, Birmingham or Chicago)

Per Cent Off List

Machine bolts	70
Carriage bolts	70
Lag bolts	70
Plug bolts, Nos. 1, 2, 3 and 7 heads	70
Hot-pressed nuts, blank or tapped, square	70
Hot-pressed nuts, blank or tapped, hexagons	70
C.p.e. and t. square or hex. nuts, blank or tapped	70
Semi-finished hexagon nuts	70
Semi-finished hexagon castellated nuts, S.A.E.	70
Stove bolts in packages, P'gh	70, 25 and 10
Stove bolts in packages, Ch'go	70, 25 and 10
Stove bolts in bulk, P'gh	70, 25 and 10
Stove bolts in bulk, Chicago	70, 25 and 10
Stove bolts in bulk, Cleveland	70, 25 and 10
Tire bolts	60

Large Rivets

(1/2-in. and larger)

Base per 100 Lb.	
F.o.b. Pittsburgh or Cleveland	\$2.75
F.o.b. Chicago and Birmingham	2.80

Small Rivets

(7/16-in. and smaller)

Per Cent Off List	
F.o.b. Pittsburgh	70 and 10
F.o.b. Cleveland	70 and 10
F.o.b. Chicago and Birm'g'm	70 and 10

Cap and Set Screws

(Freight allowed up to but not exceeding 65c. per 100 lb. on lots of 200 lb. or more)

Per Cent Off List

Milled cap screw, 1 in. dia. and smaller	75, 10 and 10
Milled standard set screws, case hardened, 1 in. dia. and smaller	75 and 10
Milled headless set screws, cut thread 1/2 in. and smaller	70
Upset hex. head cap screw, U.S.S.S. or S.A.E. thread, 1 in. dia. and smaller	80
Upset set screws cut and oval point	75 and 10
Milled studs	65 and 10

STAINLESS STEEL

(18% Cr. 8% Ni. 0.08 to 0.12% C) (Base Prices, f.o.b. Pittsburgh)

Delivered Detroit	
Rerolling	\$29.00
Forging quality	34.00

Wire Rods

(Common soft, base)

	Per Gross Ton
Pittsburgh	\$36.00
Cleveland	36.00
Chicago	37.00
Birmingham	39.00
Youngstown (del'd)	37.00

ALLOY STEEL BLOOMS, BILLETS AND SLABS

F.o.b. Pittsburgh, Chicago, Buffalo, Massillon, Canton or Bethlehem.
Base price, \$49 a gross ton except at Bethlehem, where it is \$52.
Price del'd Detroit is \$52.

CARBON STEEL FORGING INGOTS

F.o.b. Pittsburgh, Youngstown or Chicago.
Uncropped, \$28 per gross ton.

COKE, COAL AND FUEL OIL

Coke	Per Net Ton
Furnace, f.o.b. Connellsville	\$3.50
Prompt	
Foundry, f.o.b. Connellsville	\$4.25 to 5.25
Prompt	
Foundry, by-product, Chicago ovens, for delivery outside switching district	8.50
Foundry, by-product, delivered in Chicago switching district	9.25
Foundry, by-product, New England, delivered	10.50
Foundry, by-product, Newark or Jersey City, del'd	8.20 to 8.81
Foundry, by-product, Phila.	9.00
Foundry, by-product, Cleveland delivered	9.25
Foundry, Birmingham	4.75
Foundry, by-product, St. Louis, f.o.b. ovens	8.00
Foundry, by-product, del'd St. Louis	9.00

Coal	Per Net Ton
Mine run steam coal, f.o.b. W. Pa. mines	\$1.55 to \$1.80
Mine run coking coal f.o.b. W. Pa. mines	1.80 to 2.00
Gas coal, % in f.o.b. Pa. mines	2.00 to 2.30
Mine run gas coal, f.o.b. Pa. mines	1.80 to 2.20
Stem slack, f.o.b. W. Pa. mines	1.30 to 1.40
Gas slack, f.o.b. W. Pa. mines	1.65 to 1.85

Fuel Oil	Per Gal. f.o.b. Bayonne, N. J.
No. 3 distillate	4.00c.
No. 4 industrial	3.50c.

Per Gal. f.o.b. Baltimore	Per Gal. del'd Chicago
No. 3 distillate	4.00c.
No. 4 industrial	3.50c.

Per Gal. f.o.b. Cleveland	Per Gal. del'd Chicago
No. 3 distillate	5.75c.
No. 4 industrial	5.50c.

REFRACTORIES

Fire Clay Brick	Per 1000 f.o.b. Works
High-heat intermediate Duty Brick	\$45.00
Duty Brick	\$40.00
Pennsylvania	45.00
Maryland	45.00
New Jersey	43.00
Ohio	45.00
Kentucky	45.00
Missouri	45.00
Illinois	45.00
Ground fire clay, per ton	7.00

Chrome Brick	Per Net Ton
Standard size	\$45.00

Silica Brick	Per 1000 f.o.b. Works
Pennsylvania	\$45.00
Chicago	\$40.00
Birmingham	\$55.00
Silica clay, per ton	8.00

Magnesite Brick	Per Net Ton
Standard sizes, burned, f.o.b. Baltimore and Chester, Pa.	\$65.00
Unburned, f.o.b. Baltimore	55.00
Grain magnesite, f.o.b. Baltimore and Chester, Pa.	40.00
Domestic, f.o.b. Chewelah, Wash.	22.00

CAST IRON PIPE

	Per Net Ton
6-in. and larger, del'd Chicago	\$44.00 to \$45.00
4-in., del'd Chicago	47.00 to 48.00
6-in. and larger, del'd New York	43.00
4-in. del'd New York	46.00
6-in. and larger, Birmingham	36.00 to 37.00
4-in. Birmingham	39.00 to 40.00
Class "A" and gas pipe, \$3 extra.	

Pig Iron, Ores, Ferroalloys

PIG IRON

PRICES PER GROSS TON AT BASING POINTS

Basing Points	No. 2 Fdry.	Malleable	Basic	Bessemer
Everett, Mass.	\$18.50	\$19.00	\$18.00	\$19.50
Bethlehem, Pa.	18.50	19.00	18.00	19.50
Birdsboro, Pa.	18.50	19.00	18.00	19.50
Swedeland, Pa.	18.50	19.00	18.00	19.50
Sparrows Point, Md.	18.50	19.00	18.00	19.50
Neville Island, Pa.	18.00	17.50	17.00	18.00
Sharpsville, Pa.	17.50	17.50	17.00	18.00
Youngstown	17.50	17.50	17.00	18.00
Buffalo	17.50	18.00	16.50	18.50
Erie, Pa.	17.50	18.00	17.00	18.50
Cleveland	17.50	17.50	17.00	18.00
Toledo, Ohio	17.50	17.50	17.00	18.00
Detroit	17.50	17.50	17.00	18.00
Hamilton, Ohio	17.50	17.50	17.00	18.00
Chicago	17.50	17.50	17.00	18.00
Granite City, Ill.	17.50	18.00	17.00	18.00
Duluth, Minn.	18.00	18.00	18.50	18.00
Birmingham	13.50	12.50	18.00	
Provo, Utah	16.50			

DELIVERED PRICES PER GROSS TON AT CONSUMING CENTERS

	No. 2 Fdry.	Malleable	Basic	Bessemer
Boston Switching District	\$19.00	\$19.50	\$18.50	\$20.00
From Everett, Mass.	19.00	19.50	18.50	20.00
Brooklyn				
From East, Pa. or Buffalo	20.77	21.27	20.27	21.77
Newark or Jersey City, N. J.				
From East, Pa. or Buffalo	19.89	20.39	19.39	20.89
Philadelphia				
From Eastern Pa.	19.26	19.76	18.76	20.26
Cincinnati				
From Hamilton, Ohio	18.51	18.51	18.01	19.01
Canton, Ohio				
From Cleveland and Youngstown	18.76	18.76		
Columbus, Ohio				
From Hamilton, Ohio	19.50	19.50		
Mansfield, Ohio				
From Cleveland and Toledo	19.26	19.26		
Indianapolis				
From Hamilton, Ohio	19.77	19.77		
South Bend, Ind.				
From Chicago	19.53	19.53		
Milwaukee				
From Chicago	18.50	18.50		
St. Paul				
From Duluth	19.44			
Davenport, Iowa				
From Chicago	19.26	19.26		
Kansas City				
From Granite City	20.04	20.54		

Delivered prices on Southern iron for shipment to Northern points are 38c. a gross ton below delivered prices from the nearest Northern basing points.

LOW PHOSPHORUS PIG IRON

Basing points: Birdsboro, Pa., Steelton, Pa., and Standish, N. Y.	\$23.00
Johnson City, Tenn.	19.00
Del'd Chicago	24.65

GRAY FORGE PIG IRON

Valley furnace	\$17.50
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CHARCOAL PIG IRON

Lake Superior furnace	\$20.50
Delivered Chicago	23.54
Delivered Buffalo	23.78

CANADA

Pig Iron

Per gross ton:	Delivered Toronto
No. 1 fdy., sil. 2.25 to 2.75	\$21.00
No. 2 fdy., sil. 1.75 to 2.75	20.50
Malleable	21.00
Delivered Montreal	
No. 1 fdy., sil. 2.25 to 2.75	\$22.50
No. 2 fdy., sil. 1.75 to 2.25	22.00
Malleable	22.50
Basic	22.00

Ferromanganese

	<i>Per Gross T</i>
Domestic, 80%, seaboard, (carload)	\$85.
Domestic, 80%, seaboard, (ton lots)	92

Spiegeleisen

<i>Per Gross Ton Furnace</i>	
Domestic, 19 to 21%.....	\$26.

Electric Ferrosilicon

	Per Gross Ton Delivered
50% (carloads)	\$77.
50% (ton lots)	85.
75% (carloads)	126.
75% (ton lots)	136.
14% to 16% (f.o.b.) Welland.	
Ont. (in carloads) (duty paid)	31.
14% to 16% (less carloads)	38.

Silvery Iron

F.o.b. Jackson, Ohio, Furnace			
Per Gross Ton		Per Gross T	
6%	.....\$22.25	12%	.....\$29.
7%	.....23.25	13%	.....30.
8%	.....24.25	14%	.....32.
9%	.....25.25	15%	.....33.
10%	.....26.25	16%	.....35.
11%	.....27.75	17%	.....36.

Ferrovanadium, del., per lb. contained V.	\$2.70 to \$2.90
Ferrocobaltititanium, 15 to 18% Ti, 6 to 8% C, f.o.b. furnace carload and contract per net ton	\$137.50
Ferrophosphorus, electric, or blast furnace material, in carloads, 18%, Rockdale, Tenn., base, per gross ton with \$2 unitage	50.00
Ferrophosphorus, electric, 24% f.o.b. Anniston, Ala., per gross ton with \$2.75 unitage	65.00
Ferromolybdenum, per lb. Mo., del.	95c.
Calcium molybdate, per lb. Mo., del.	80c.
Silico spiegel, per ton, f.o.b. furnace, car lots	\$38.00
Ton lots or less, per ton	45.50
Silico-manganese, gross ton, delivered:	
2.50% carbon grade	90.00
2% carbon grade	85.00
1% carbon grade	105.00
Spot prices	\$5 a ton higher

Ores

Lake Superior Ores, Delivered Lower Lake Ports	Per Gross Ton
Old range, Bessemer, 51.5% iron	\$4.80
Old range, non-Bessemer, 51.50% iron	4.65
Mesabi, Bessemer, 51.50% iron	4.65
Mesabi, non-Bessemer, 51.50% iron	4.50
High phosphorus, 51.50% iron	4.40

Foreign Ore, c.i.f. Philadelphia or Baltimore	Per Unit
Iron, low phos., copper free, 55 to 58% iron, dry Spanish or Algerian	9.50c.
Iron, low phos., Swedish, average 68 1/2% iron	9.50c.
Iron, basic or foundry, Swedish, average, 65% iron	9c.
Iron, basic or foundry, Russian, average, 65% iron	9c.
Manganese, Caucasian, washed 52%	24c.
Manganese, African, Indian, 44-48%	21c.
Manganese, African, Indian, 49-51%	24c.
Manganese, Brazilian, 46 to 48%	20c.

	Per Net Ton Unit
Tungsten, Chinese wolframite, duty paid, delivered*	\$15.00
Tungsten, domestic scheelite, delivered	\$14.50 to \$15.00

	<i>Per Gross Ton</i>
Chrome, 45%, Cr ₂ O ₃ , crude, c.i.f. Atlantic Seaboard	\$17.00
Chrome, 48% Cr ₂ O ₃ , c.i.f. Atlantic Seaboard	20.00

*Quotations nominal in absence of sales.

Fluorspar

Per Net Ton	
Domestic, washed gravel, 85-5 f.o.b. Kentucky and Illinois mines for all-rail shipment.....	\$17.00
Same grade for Ohio River barge shipment for Kentucky and Illinois River landings.....	18.50
No. 2 lump, 85-5, f.o.b. Kentucky and Illinois mines.....	\$17.50 to 18.00
Foreign, 85% calcium fluoride, not over 5% silicon, c.i.f. Atlantic port, duty paid.....	19.00
Domestic, No. 1 ground bulk, 85 to 98% calcium fluoride, not over 2% silicon, f.o.b. Illinois and Kentucky mines.....	30.00

Iron and Steel Scrap

PITTSBURGH	
Per gross ton delivered consumers' yards:	
No. 1 heavy melting steel, \$14.00 to \$14.50	
Compressed heavy melting steel, 13.25 to 13.75	
No. 2 railroad wrought . . .	14.00 to 14.50
Scrap rails . . .	14.00 to 14.50
Rails 3 ft. and under . . .	15.50 to 16.00
Sheet bar crops, ordinary . . .	15.00 to 15.50
Compressed sheet steel . . .	14.00 to 14.50
Hand bundle, steel . . .	12.50 to 13.00
Hvy. steel axle turnings . . .	13.00 to 13.50
Machine shop turnings . . .	11.00 to 11.50
Short shov. steel turnings . . .	11.00 to 11.50
Short mixed borings and turnings . . .	8.50 to 9.00
Cast iron borings . . .	8.50 to 9.00
Cast iron car wheels . . .	13.00 to 13.50
Heavy breakable cast . . .	12.00 to 12.50
No. 1 cast . . .	13.50 to 14.00
Railr. knuckles and couplers . . .	16.00 to 16.50
Rail coal and leaf springs . . .	16.00 to 16.50
Rolled steel wheels . . .	16.00 to 16.50
Low phos. billet crops . . .	17.00 to 17.50
Low phos. sheet bar crops . . .	16.50 to 17.00
Low phos. punchings . . .	16.00 to 16.50
Low phos. punchings . . .	16.00 to 16.50
Steel car axles . . .	17.00 to 17.50

CHICAGO	
Delivered Chicago district consumers:	
Per Gross Ton	
Heavy melting steel	\$11.75 to \$12.25
Shoveling steel	11.75 to 12.25

Hydraulic comp. sheets	.....\$10.75 to \$11.25
Drop forge flashings	.....9.75 to 10.25
No. 1 busheling	.....10.50 to 11.00
Rolled carwheels	.....12.50 to 13.00
Railroad tires	.....12.50 to 13.00
Railroad leaf springs	.....12.50 to 13.00
Axle turnings	.....9.50 to 10.00
Steel couplers and knuckles	.....12.50 to 13.00
Coil springs	.....12.75 to 13.25
Axle turnings (elec. fur.)	.....10.50 to 11.00
Low phos. punchings	.....12.25 to 12.75
Low phos. plates, 12 in. and under	.....12.75 to 13.25
Cast iron borings	.....7.25 to 7.75
Short shoveling turnings	.....7.25 to 7.75
Machine shop turnings	.....6.75 to 7.25
Revolving rails	.....12.50 to 13.00
Steel rails, less than 3 ft.	.....12.50 to 13.00
Steel rails, less than 2 ft.	.....13.00 to 13.50
Angle bars, steel	.....12.50 to 13.00
Cast iron carwheels	.....11.75 to 12.25
Railroad malleable	.....12.00 to 12.50
Agricultural malleable	.....10.00 to 10.50

Per Net Ton	
Iron car axles	\$12.75 to \$13.25
Steel car axles	12.25 to 12.75
No. 1 railroad wrought	9.50 to 10.00
No. 2 railroad wrought	11.00 to 11.50

No. 2 busheling	\$4.50 to \$5.00
Locomotive tires, smooth	10.50 to 11.00
Pipe and flues	5.50 to 6.00
No. 1 machinery	9.50 to 10.00
Clean automobile cast	9.00 to 9.50
No. 1 railroad cast	9.00 to 9.50
No. 1 agricultural cast	8.50 to 9.00
Stove plate	7.50 to 8.00
Grate bars	6.50 to 7.00
Brake shoes	8.50 to 9.00

PHILADELPHIA

Per gross ton delivered consumers' yards:	
No. 1 heavy melting steel	\$11.50 to \$12.00
No. 2 heavy melting steel	9.50 to 10.00
No. 1 railroad wrought	11.00
Bundled sheets	9.50
Hydraulic compressed, new	10.00
Hydraulic compressed, old	8.50 to 9.00
Machine shop turnings	7.50
Heavy axle turnings	10.00 to 10.50
Cast borings	5.50 to 6.00
Heavy breakable cast	11.50 to 12.00
Stove plate (steel works)	9.00 to 9.50
No. 1 low phos. heavy	15.00 to 15.50
Couplers and knuckles	14.50 to 15.00
Roller steel wheels	14.50 to 15.00
No. 1 blast furnace	5.50 to 6.00
Spec. iron and steel pipe	9.00 to 9.50
Shafting	16.00 to 16.50
Steel axles	14.50
No. 1 forge fire	11.00
Cast iron car wheels	13.00
No. 1 cast	13.00 to 13.50
Cast borings (chem.)	12.00 to 14.00
Steel rails for rolling	13.00

CLEVELAND

Per gross ton delivered consumers' yards:	
No. 1 heavy melting steel	\$12.00 to \$12.50
No. 2 heavy melting steel	11.50 to 12.00
Compressed sheet steel	11.50 to 12.00
Light bundled sheet stampings	8.50 to 9.00
Drop forge flashings	11.50 to 12.00
Machine shop turnings	9.00 to 9.50
Short shoveling turnings	9.00 to 9.50
No. 1 busheling	11.00 to 11.50
Steel axle turnings	10.00 to 10.50
Low phos. billet crops	14.50 to 15.00
Cast iron borings	8.75 to 9.25
Mixed borings and short turnings	9.00 to 9.50
No. 2 busheling	9.00 to 9.50
No. 1 cast	11.00 to 11.50
Railroad grate bars	7.50 to 8.00
Stove plate	7.00 to 7.50
Rails under 1 ft.	15.00 to 15.50
Rails for rolling	17.00 to 17.50
Railroad malleable	12.00 to 12.50
Cast iron carwheels	12.25

BUFFALO

Per gross ton, f.a.b. Buffalo consumers' plants:	
No. 1 heavy melting steel	\$13.00
No. 2 heavy melting steel	12.50
Scrap rails	\$12.25 to 12.75
New hydraulic comp. sheets	11.50
Old hydraulic comp. sheets	10.50
Drop forge flashings	11.00
No. 1 busheling	11.50
Hyv. steel axle turnings	10.00 to 10.50
Machine shop turnings	7.00 to 7.50
Knuckles and couplers	14.50 to 15.00
Coil and leaf springs	14.50 to 15.00
Roller steel wheels	14.50 to 15.00
Low phos. billet crops	14.50 to 15.00
Short shov. steel turnings	8.50 to 9.00
Short mixed borings and turnings	8.50 to 9.00
Cast iron borings	8.50 to 9.00
No. 2 busheling	7.50 to 8.00
Steel car axles	13.00 to 13.50
Iron axles	13.00 to 13.50
No. 1 machinery cast	13.00 to 13.50
No. 1 cupola cast	12.00 to 12.50
Stove plate	10.25 to 10.75
Steel rails, 3 ft. and under	14.50 to 15.00
Cast iron carwheels	12.50 to 13.00
Industrial malleable	12.50 to 13.00
Railroad malleable	12.50 to 13.00
Chemical borings	10.00 to 11.00

BIRMINGHAM

Per gross ton delivered consumers' yards:	
Heavy melting steel	\$10.00
Scrap steel rails	9.00
Short shoveling turnings	5.50
Stove plates	\$7.00 to 7.50
Steel axles	10.50 to 11.00
Iron axles	10.50 to 11.00
No. 1 railroad wrought	7.00
Rails for rolling	10.50
No. 1 cast	9.00 to 9.50
Tramcar wheels	9.00 to 9.50
Cast iron borings, chem.	8.00

ST. LOUIS

Per gross ton delivered consumers' yards:	
Selected heavy steel	\$10.00 to \$10.50
No. 1 heavy melting	9.50 to 10.00
No. 2 heavy melting	9.25 to 9.75
No. 1 locomotive tires	9.50 to 10.00
Misc. stand.-sec. rails	9.50 to 10.00
Railroad springs	10.00 to 10.50
Bundled sheets	6.50 to 7.00
No. 2 railroad wrought	9.50 to 10.00
No. 1 busheling	7.00 to 7.50
Cast iron borings and shoveling turnings	5.25 to 5.75
Rails for rolling	11.00 to 11.50
Machine shop turnings	11.25 to 11.75
Heavy turnings	6.00 to 6.50
Steel car axles	10.50 to 11.00
Iron car axles	13.50 to 14.00
No. 1 railroad wrought	6.00 to 6.50
Steel rails less than 3 ft.	12.00 to 13.00
Steel angle bars	10.00 to 10.50
Cast iron carwheels	9.50 to 10.00
No. 1 machinery cast	10.00 to 10.50
Railroad malleable	9.75 to 10.25
No. 1 railroad cast	9.00 to 9.50
Stove plate	6.50 to 7.00
Agricuilt. malleable	9.00 to 9.50

BOSTON

Dealers' buying prices per gross ton:	
No. 1 heavy melting steel	\$8.00 to \$8.25
Scrap T rails	8.00 to 8.25
No. 2 steel	6.50 to 7.00
Breakable cast	6.50 to 7.00
Machine shop turnings	4.00 to 4.50
Bundled skeleton, long	6.00 to 6.50
Forge flashings	5.50 to 6.00
Blast furnace scrap	2.75 to 3.00
Shafting	11.00 to 11.25
Steel car axles	10.50 to 11.00
Wrought pipe	5.00 to 5.25
Cast iron borings, chemical	8.50 to 9.00
Per gross ton delivered consumers' yards:	
Textile cast	\$10.00 to \$10.50
No. 1 machinery cast	10.00 to 10.25
Stove plate	7.00 to 7.25
Railroad malleable	11.00 to 11.50

NEW YORK

Dealers' buying prices per gross ton:	
No. 1 heavy melting steel	\$8.00 to \$9.50
No. 2 heavy melting steel	7.00 to 8.00
Heavy breakable cast	8.00 to 8.25
No. 1 machinery cast	8.50
No. 2 cast	7.00 to 7.50
Stove plate	6.00
Steel car axles	10.50 to 10.75
No. 1 railroad wrought	7.50 to 8.00
No. 1 yard wrought, long	6.50 to 7.00
Spec. iron and steel pipe	5.75 to 6.00

PITTSBURGH

Base per Lb.	
Plates	3.05c.
Structural shapes	3.05c.
Soft steel bars and small shapes	2.85c.
Reinforcing steel bars	3.00c.
Cold-finished and screw stock	
Rounds and hexagons	*3.45c.
Squares and flats	*3.45c.
Hoops and bands, under 1/4 in.	3.10c.
Hot-rolled annealed sheets (No. 24), 12 or more bundles	3.15c.
Galv. sheets (No. 24), 25 or more bundles	3.70c.
Hot-rolled sheets (No. 10)	2.85c.
Galv. corrug. sheets (No. 28), per square (more than 3750 lb.)	\$3.32
Spikes, large	2.90c.
Track bolts, all sizes, per 100	65 per cent off list.
Machine bolts, 100 count	65 per cent off list.
Carriage bolts, 100 count	65 per cent off list.
Nuts, all styles, 100 count	65 per cent off list.
Large rivets, base per 100 lb.	\$3.25
Wire, black, soft ann'd, base per 100 lb.	*2.875c.
Wire, galv. soft, base per 100 lb.	*2.925c.
Common wire nails, per keg	*2.575c.
Cement coated nails, per keg	*2.575c.
On plates, structural, bars, reinforcing bars, bands, hoops and blue annealed sheets, base applied to orders of 400 to 9999 lb.	
*Delivered in Pittsburgh switching district.	

CHICAGO

Base per Lb.	
Plate and structural shapes	3.10c.
Soft steel bars	2.90c.
Cold-fn. steel bars and shafting	
Rounds and hexagons	3.40c.
Flats and squares	3.40c.
Bands, 3/16 in. (in Nos. 10 and 12 gages)	3.20c.
Hoops (No. 14 and lighter)	3.20c.
Hot-rolled annealed sheets (No. 24)	3.70c.
Galv. sheets (No. 24)	4.30c.
Hot-rolled sheets (No. 10)	2.85c.
Spikes (9/16 in. and lighter)	2.575c.
Track bolts	4.65c.
Rivets, structural (keg lots)	3c.
Rivets, boiler (keg lots)	3.10c.
Per Cent Off List	
Machine bolts	60 and 5
Carriage bolts	60 and 5
Coach and lag screws	60 and 5
Hot-pressed nuts, sq. tap or blank	60 and 5
Hot-pressed nuts, hex. tap or blank	60 and 5
Hex. head and cap screws	60 and 5
Cup point set screws	70
Flat head bright wood screws	37 1/2 and 10
Spring rollers	50
Stove bolts in full packages	72 1/2
Rd. hd. tank rivets, 7/16 in. and smaller	65
Wrought washers	\$5.50 off list
No. 8 black ann'd wire per 100 lb.	\$3.75
Com. wire nails, base per keg	2.70c.
Cement c't'd nails, base per keg	2.70c.

NEW YORK

Base per Lb.	
Plates	3.30c.
Structural shapes	3.27c.
Soft steel bars, small shapes	3.17c.
Iron bars	3.24c.
Iron bars, swed. charcoal	6.50 to 7.25c.
Cold-fn. shafting and screw stock	
Rounds and hexagons	3.92c.
Flats and squares	4.42c.
Cold-roll. strip, soft and quarter hard	4.00c.
Woods	3.42c.
Bands	3.42c.
Hot-rolled sheets (No. 10)	3.17c.
Hot-rolled ann'd sheets (No. 24*)	3.65c.
Galvanized sheets (No. 24*)	4.25c.
Long term sheets (No. 24)	5.00c.
Standard tool steel	11.00c.
Wire, black annealed (No. 10)	3.30c.
Wire, galv. (No. 10)	3.80c.

Forge fire	\$5.50 to \$6.00
Rails for rolling	9.00 to 9.25
Short shoveling turnings	3.90 to 4.40
Machine shop turnings	3.50 to 4.00
Cast borings	4.50 to 4.75
No. 1 blast furnace	2.50 to 4.00
Cast borings (chemical)	11.00 to 11.50
Unprepared yard iron and steel	5.00 to 5.50
Per gross ton, delivered local foundries:	
No. 1 machinery cast	\$12.00
No. 1 hvy. cast (cupola size)	10.50
No. 2 cast	9.00

CINCINNATI

Dealers' buying prices per gross ton:	
Heavy melting steel	\$8.75 to \$9.50
Scrap rails for melting	9.50 to 10.00
Loose sheet clippings	5.25 to 5.75
Bundled sheets	6.50 to 7.00
Cast iron borings	6.50 to 7.00
Machine shop turnings	6.00 to 6.50
No. 1 busheling	7.00 to 7.50
No. 2 busheling	4.00 to 4.50
Rails for rolling	10.00 to 10.50
No. 1 locomotive tires	9.50 to 10.00
Short rails	12.25 to 12.75
Cast iron carwheels	8.75 to 9.25
No. 1 machinery cast	10.00 to 10.50
No. 1 railroad cast	9.50 to 10.00
Burnt cast	7.00 to 7.50
Stove plate	7.00 to 7.50
Agricultural malleable	9.00 to 9.50
Railroad malleable	9.00 to 9.50

Tire steel, 1 x 1/2 in. and larger	3.50c.
Open hearth spring steel, bases	4.00c. to 10.00c.
Common wire nails, base, per keg	\$3.00
Per Cent Off List	
Machine bolt, cut thread:	
Up to 1 in. dia. inclusive	60
Over 1 in. dia.	50
Carriage bolts, cut thread:	
Up to 1/2 in. dia. inclusive	60
Over 1/2 in. dia.	50
Boiler tubes:	Per 100 Ft.
Lap welded, 2-in.	\$18.05
Seamless welded, 2-in.	10.24
Charcoal iron, 2-in.	24.94
Charcoal iron, 4-in.	63.65
*No. 28 and lighter, 36 in. wide, 20c. higher per 100 lb.	

ST. LOUIS

Base per Lb.	
Plates and struc. shapes	3.34c.
Bars, soft steel or iron	3.14c.
Cold-fn. rounds, shafting, screw stock	3.74c.
Hot-rolled annealed sheets (No. 24)	3.94c.
Galv. sheets (No. 24)	4.54c.
Hot-rolled sheets (No. 10)	3.19c.
Black corrug. sheets (No. 24)	3.99c.
*Galv. corrug. sheets	4.59c.
Structural rivets	3.59c.
Boiler rivets	3.69c.
Per Cent Off List	
Tank rivets, 7/16 in. and smaller	60
Machine and carriage bolts, lag screws, fitting up bolts, bolt ends, plug bolts, hot-pressed nuts, square and hexagon, tapped or blank, semi-finished nuts	
1000 lb. or over	60
200 to 999 lb.	55 and 5
100 to 199 lb.	50 and 5
Less than 100 lb.	50
*No. 26 and lighter take special prices.	

PHILADELPHIA

Base per Lb.	
*Plates, 1/4-in. and heavier	2.75c.
*Structural shapes	2.75c.
*Soft steel bars, small shapes, iron bars (except bands)	2.75c.
*Reinforc. steel bars, sq. twisted and deformed	2.505c.
Cold-finished steel bars	3.73c.
*Steel hoops	3.30c.
*Steel bands, No. 12 to 3/16 in.	3.05c.
Spring steel	5.00c.
*Hot-rolled annealed sheets (No. 24)	3.40c.
*Galvanized sheets (No. 24)	4.00c.
*Hot-rolled annealed sheets (No. 10)	2.95c.
Diam. pat. floor plates, 1/4 in.	4.35c.
Swedish iron bars	6.25c.

These prices are subject to quantity differentials except on reinforcing and Swedish iron bars.

*Basis prices subject to deduction on orders aggregating 4000 lb. or over.

†For 50 bundles or over.

‡For 5 tons or more, exclusive of cutting charge.

CLEVELAND

Base per Lb.	
Plates and struc. shapes	3.21c.
Soft steel bars	2.90c.
Reinforc. steel bars	2.00c. to 2.50c.
Cold-finished steel bars	3.40c.
Flat rolled steel under 1/4 in.	3.28c.
Cold-finished strip	5.55c.
Hot-rolled annealed sheets (No. 24)	3.76c.
Galvanized sheets (No. 24)	4.36c.
Hot-rolled sheets (No. 10)	3.01c.
Black ann'd wire, per 100 lb.	\$2.45
No. 9 galv. wire, per 100 lb.	2.80
Com. wire nails, base per keg	2.45

CINCINNATI

Base per Lb.	
Plates and struc. shapes	3.30c.
Bars, soft steel or iron	3.10c.
New billet reinforce. bars	3.19c.
Rail steel reinforce. bars	3.19c.

DETROIT

Dealers' buying prices per gross ton:	
Heavy melting steel	\$9.50 to \$10.00
Borings and short turnings	7.50 to 8.00
Long turnings	6.75 to 7.25
No. 1 machinery cast	11.00 to 11.50
Automotive cast	12.00 to 12.50
Hydraul. comp. sheets	10.00 to 10.50
Stove plate	8.00 to 8.50
New factory busheling	8.75 to 9.25
Old No. 2 busheling	5.75 to 6.25
Sheet clippings	7.00 to 7.50
Flashings	8.25 to 8.75
Low phos. plate scrap	10.00 to 10.50

CANADA

Dealers' buying prices per gross ton:	
Toronto Montreal	
Heavy melting steel	\$5.50 \$5.50
Rails, scrap	6.00 4.50
Machine shop turnings	2.50 2.50
Boiler plate	4.50 4.50
Heavy axle turnings	2.50 2.50
Cast borings	3.00 3.00
Steel borings	2.00 2.00
Wrought pipe	2.50 2.50
Steel axles	4.50 6.00
Axles, wrought iron	4.50 6.00
No. 1 machinery cast	7.75 9.00
Stove plate	4.50 5.00
Standard carwheels	7.25 7.00
Malleable	6.75 7.00

Hoops and bands, 3/16 in. and lighter	3.35c.
Cold-finished bars	3.70c.
Hot-rolled annealed sheets (No. 24)	3.85c.
Galv. sheets (No. 24)	4.45c.
Hot-rolled sheets (No. 10)	3.15c.
Structural rivets	4.00c.
Small rivets	60 per cent off list
No. 9 ann'd wire, per 100 lb.	\$3.00
Com. wire nails, base per keg (10 to 49 kegs)	2.65
Larger quantities	2.50
Cement c'd nails, base 100-lb. keg	2.95
Chain, 1-in., per 100 lb.	8.25
	Net per 100 Ft.
Seamless steel boiler tubes, 2-in.	\$17.85
4-in.	41.40
Lap-welded steel boiler tubes, 2-in.	16.60
4-in.	38.75

Reinforcing Steel •

Awards 3950 Tons—New Projects 8850 Tons

AWARDS

Norfolk, Mass., 190 tons, dormitories, to Truscon Steel Co.

Mattapan, Mass., 100 tons, hospital units, to Concrete Steel Co. and Truscon Steel Co.

New York, 800 tons, midtown tunnel, to Concrete Steel Co.

New York, 550 tons, final section of West Side elevated highway, divided between National Bridge Works and Joseph T. Ryerson & Sons, Inc.

Morris and Passaic Counties, N. J., 140 tons, viaduct, to Kalman Steel Corp.

Cincinnati, 400 tons, interceptor sewer, to West Virginia Rail Co.

Cleveland, 220 tons, service station, for Firestone Tire & Rubber Co., to Concrete Steel Co.

State of Colorado, 195 tons, highway work in four counties, to various bidders.

Wiota, Mont., 100 tons, bridge over Missouri River, to Kalman Steel Corp.

Los Angeles, 200 tons, addition for Continental Can Co., to an unnamed bidder.

Tulare County, Cal., 120 tons, State highway work, to Soule Steel Co.

Los Angeles County, Cal., 335 tons, two State bridges, to Concrete Engineering Co.

Santa Barbara County, Cal., 245 tons, two State bridges, to Blue Diamond Corp.

Los Angeles, 150 tons, County Medical Association library, to Truscon Steel Co.

Palo Alto, Cal., 200 tons, trusses for dormitory at Stanford University, to Soule Steel Co.

NEW REINFORCING BAR PROJECTS

Buffalo, 350 tons, school No. 37; bids this week.

Middlesex County, N. J., 125 tons, highway and structures; bids April 9.

Beach Haven, N. J., 120 tons, State highway; Edward Hollis, Westville, N. J., general contractor.

Allegheny, Monroe and Crawford Counties, Pa., 150 tons, highway work; bids April 6 to State Highway Department.

Lexington, Ky., 250 tons, sewer.

Chicago, tonnage being estimated, Sanitary District project No. 10.

Gretna, La., 175 tons, filtration plant for waterworks; bids opened March 27.

New Orleans, 200 tons, buildings for Dillard University, bids opened March 28.

Columbus, Ohio, 2860 tons, filtration plant.

Boulder Dam, Colo., 175 tons, material for Boulder Dam; bids under advisement.

State of Colorado, 109 tons, highway work in two counties; bids March 22.

Grand County, Colo., 110 tons, State overhead crossing; bids April 3.

Glasgow, Mont., 160 tons, filtration plant; bids April 6.

Fortpeck, Mont., 3250 tons, tunnels.

Sacramento, Cal., 135 tons, State structures on N Street; bids under advisement.

San Diego, 260 tons, El Capitan dam for city; bids April 9.

Los Angeles, 400 tons, two bridges on Gafey Ave.; bids April 11.

Seattle, 1012 tons, material for Railway Avenue seawall; bids March 29.

Railroad Equipment

Chicago Great Western has applied to Interstate Commerce Commission for authority to borrow not exceeding \$1,200,000 from PWA for purchase of 500 steel box cars of 100,000-lb. capacity each. Application states that tentative price has been received from one car builder indicating that cars can be built at a cost of about \$2,300 each.

Seattle closes bids March 29 on 100 tons of track bolts for Railway Avenue seawall.

Great Western Electro-Chemical Co. has ordered two tank cars from General American Tank Car Corp.

Erie has received a second loan of \$2,671,000 from PWA to cover the purchase of rails and fastenings, as well as the rebuilding of freight cars in company shops at Dunmore, Pa.

Savannah & Atlanta has secured a loan of \$250,000 from PWA for purchase of 100 box cars.

RAILS

The Rock Island is considering purchase of 5000 tons of rails.

Boston & Maine has placed 30,000 tons of rails, with necessary track supplies, with the Bethlehem Steel Co.

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MILLS at Ambridge, Pa. and Chicago, Ill.

Manufacturers of
COLD DRAWN STEELS
Turned and Polished Shafting, Turned and Ground Shafting

Fabricated Structural Steel

Lettings Decline—New Projects Also Lower

AWARDS of 12,250 tons were mostly for small tonnages and compare with 29,200 tons in the previous week and 14,800 tons two weeks ago. The two largest lettings were 2460 tons for a State hospital at Brentwood, Long Island, and 1300 tons for the midtown tunnel in New York. New projects of 10,400 tons compare with 21,400 tons last week. The only new inquiry of size is 1600 tons for a Wheeling Steel Corp. plant at Yorkville, Ohio. Plate awards of 13,000 tons are swelled by 10,660 tons for an electric welded pipe line for the St. Louis waterworks. New plate inquiries are also large, calling for 12,000 tons, including 8000 tons for tunnel liners at Fort Peck, Mont. Structural steel awards for the week follow:

NORTH ATLANTIC STATES

Buffalo, 350 tons, additions to Eastern States Milling plant, to McClintic-Marshall Corp.

Saratoga Springs, N. Y., 465 tons, State administration and laboratory building, to New York State Steel Corp.

Saratoga Springs, 140 tons, athletic building, to Smith & Caffrey.

Orange County, N. Y., 250 tons, highway bridge, to Lieder Iron Works.

New York, 1300 tons, midtown tunnel, to American Bridge Co.

New York, 195 tons, Brooklyn Navy Yard power plant, to Norton Steel Co.

Kearney's Point, N. J., 140 tons, building for E. I. du Pont de Nemours & Co., to McClintic-Marshall Corp.

Brentwood, L. I., 2460 tons, State hospital building, to McClintic-Marshall Corp.

Morris and Passaic Counties, N. J., 920 tons, bridge, to McClintic-Marshall Corp.

Aberdeen, Md., 200 tons, industrial building, to Bethlehem Fabricators, Inc.

Bristol, Pa., 185 tons, factory building, to Morris Wheeler & Co.

Wyoming County, Pa., 175 tons, truss spans, to American Bridge Co.

Smyrna, Del., 125 tons, school building, to Reading Steel Products Co.

Claymont, Del., 110 tons, school, to McClintic-Marshall Corp.

THE SOUTH

Stickney, W. Va., 210 tons, building, to New City Iron Works.

Ronceverte, W. Va., 145 tons, bridge, to Pittsburgh Bridge & Iron Co.

Louisville, Ky., 225 tons, addition to industrial plant, to McClintic-Marshall Corp.

Paintsville, Ky., 300 tons, highway bridge, to McClintic-Marshall Corp.

Sheffield, Ala., 200 tons, batch bins, to Stupp Brothers Bridge & Iron Co.

Apalachicola, Fla., 500 tons, swing span and beam span approaches for State causeway, to Nashville Bridge Co.

CENTRAL STATES

Marion County, Ohio, 120 tons, highway bridge, to McClintic-Marshall Corp.

Detroit, 260 tons, brewery building, to Whitehead & Kales, Inc.

Detroit, 185 tons, Chevrolet building, to Whitehead & Kales.

Jackson County, Ill., 175 tons, bridge, to St. Louis Structural Steel Co.

Chicago, 500 tons, shed, to New City Iron Works, local.

State of Iowa, 675 tons, highway bridge; 450 tons to Des Moines Steel Co.; 225 tons to Pittsburgh-Des Moines Steel Co.

St. Paul, Minn., 220 tons, bridge repairs, to Minneapolis-Moline Power Implement Co.

WESTERN STATES

Sweetwater County, Wyo., 120 tons, State bridge, to an unnamed bidder.

State of Colorado, 110 tons, highway work in four counties, to unnamed bidders.

Seattle, 100 tons, natatorium, to Isacson Iron Works.

Los Angeles, 100 tons, unloading platform, to Pacific Iron & Steel Co.

Pearl Harbor, T. H., and Summit, Canal Zone, 1100 tons additional, radio towers at Navy Base, to United States Steel Products Co.

NEW STRUCTURAL STEEL PROJECTS

NORTH ATLANTIC STATES

West Newton, Mass., 500 tons, bridge over Boston & Albany Railroad.

Amherst, Mass., 125 tons, State college dormitory.

Gowanda, N. Y., 200 tons, coal trestle for State hospital; bids taken.

Washington, 500 tons, Howard University chemical building.

State of Maryland, 285 tons, highway bridge at Hall Station.

SOUTH AND SOUTHWEST

Richmond, Va., 200 tons, Museum of Fine Arts.

Morgantown, W. Va., 450 tons, University of West Virginia dormitory buildings.

Apalachicola, Fla., 2350 tons, State causeway, Doullut & Ewing, New Orleans, low bidders.

State of Texas, 900 tons, bridges.

Florence, Ala., 600 tons, nitrate plant.

High Island, Tex., 200 tons, bridge.

Stuttgart, Ark., 500 tons, bridge.

CENTRAL STATES

Yorkville, Ohio., 1600 tons, extension to Wheeling Steel Corp. plant.

Chicago, 450 tons, addition to Campbell's Soup plant.

Chicago, 800 tons, addition to Davis department store; project postponed.

Chicago, 250 tons, grain elevator.

State of Illinois, 600 tons, highway bridges.

Milwaukee, 1200 tons sheet piling, revetment for filtration plant; Edward E. Gillen Co., Milwaukee, low bidder on general contract; bids on filtration plant will probably not be asked for 30 or 60 days.

Madison, Wis., 650 tons, grade elimination.

State of Minnesota, 350 tons, bridges.

WESTERN STATES

Uinta County, Wyo., 120 tons, State railroad underpass; bids under advisement.

Walsenburg, Colo., 270 tons, State highway bridge; bids March 29.

State of Colorado, 245 tons, State overhead crossing; bids April 3.

Pueblo County, Colo., 130 tons, railroad underpass; bids March 26.

State of California, 115 tons, highway structures in four counties, bids April 4.

Hollywood, Cal., 350 tons, Kress store.

King County, Wash., 130 tons, State bridge over Green River; bids March 27.

Lewis County, Wash., 150 tons, State bridge over Cowlitz River; bids March 27.

Bremerton, Wash., 320 tons, two cranes for Navy Yard; Judson-Pacific Co., low bidder.

Spokane, Wash., 200 tons, State highway underpass.

FABRICATED PLATE

AWARDS

New York, 600 tons, midtown tunnel, to Federal Shipbuilding & Dry Dock Co.

New York, 280 tons, plates and shapes for oil barge, to Bethlehem Steel Co.; barge to be built at Brooklyn yards of Ira S. Bushey & Sons.

State of Tennessee, 630 tons for Tennessee Valley Authority, floating equipment for Joe Wheeler dam, to Ingalls Iron Works Co.

St. Louis, 10,660 tons, electric welded steel pipe for municipal waterworks, to McClintic-Marshall Corp.

Mare Island, Cal., 100 tons, two boilers, reawarded to R. G. Meyler Corp.

Portland, Ore., 325 tons, pontoons for Port Commission, to King Brothers.

Seattle, 150 tons of sheets, pipe line for Alaska Road Commission, to Pure Iron Culvert & Tank Co.

Pearl Harbor, T. H., 250 tons, air compressor tanks, to Hardie-Tynes Mfg. Co.

NEW PROJECTS

Memphis, 325 tons, dredge hull for United States Engineer Office; bids April 10.

Memphis, 1200 tons, 64 pontoons for United States Engineer office; bids April 5.

Memphis, unstated tonnage, 50 pontoons, United States Engineer office; bids April 13.

Crede, Colo., 1250 tons, syphon.

Fort Peck, Mont., 8000 tons, tunnel liners.

Fort Peck, Mont., 750 tons, 28-in. discharge pipe, bids opened March 26.

Los Angeles, 580 tons of sheets, pipe line for Metropolitan Water District; bids under advisement.

Supplementary Code For Forged Tools

WASHINGTON, March 27.—National Recovery Administrator Hugh S. Johnson has approved the supplementary code for the forged tool industry, a division of the Fabricated Metal Products Manufacturing and Metal Finishing and Metal Coating Industry. The supplementary code for the forged tool industry becomes effective April 3. It relates only to administration and trade practices, the labor provisions of the basic code being specifically incorporated. Open prices are provided in the code, but Administrator Johnson in his order approving the code suspended the requirement for a waiting period before filed price lists could become effective.

Emery Flays Wagner Bill Before Senate Committee

(Concluded from Page 41)

the rights of their fellow-workers, of employers, and of the public."

Citing that "it is unlawful under this bill for the employer to either initiate, participate in, or 'influence' the form or policy of any labor organization," Mr. Emery said:

"This labor organization may not keep its contracts. It may demonstrate bad leadership. It may commit violence. It may be communistic in philosophy and action. But any attempt by the employer to influence a change in its form or philosophy or initiate reform, or suggest or offer to assist in forming a different organization, or to submit a plan for their joint relationship is a plain offense."

"Apply this measure to practical existing conditions," Mr. Emery said, "and observe its operation. It would make every striker remain an employee irrespective of the policy of his organization or his conduct. Every employer, under penalty of the law, must deal with him. A worker who dared to believe that any strike could be wrong or unjustified and took the striker's place, is not even an employee. A human being is thus made a legal cipher, but the employer who does not deal with representatives of a striking group who are declared by law his employees, however, disgraceful their conduct, however extreme their demands, however criminal the character of their leaders or the conduct of their strike, may be summoned from any part of the United States, charged with the unfair practice of not recognizing them or of undertaking to influence their policy or initiate a change in it and be assessed damages, or asked to reinstate those who have acted without justification."

"By design of this measure it gradually forces in operating effect but one form of labor organization and slowly but surely undertakes to drive all workers into it. It ignores successful and practical experiments in new forms of collective relationships."

"It will cast all labor relations in one mould, granting a labor monopoly to those who employ it. It will develop bitterness, discord and conflict by outlawing the development of conference and cooperation. It would destroy in one class of workers and employers the very rights which it undertakes to secure for another organization of workers. It outlaws the natural and necessary intercourse of employer and employee while ignoring or deliberately encouraging coercion and unfair practices by organized labor."

Following the sharp interchange of views between Mr. Emery and Senator Wagner, the latter agreed to

certain modifications in his pending bill. One of these was the inclusion of a ban against "coercion from any source, whether from employer or employee." Previously the prohibition of coercion applied only to the employer, no restriction whatever being placed upon coercion by union organizers or unionized employees.

Another modification agreed to by the Senator was the elimination of a section calling for the abrogation of any contracts or agreements in conflict with the terms of the bill.

Senator Wagner denied the generally accepted impression that the plan of employee representation which he persistently calls the "company

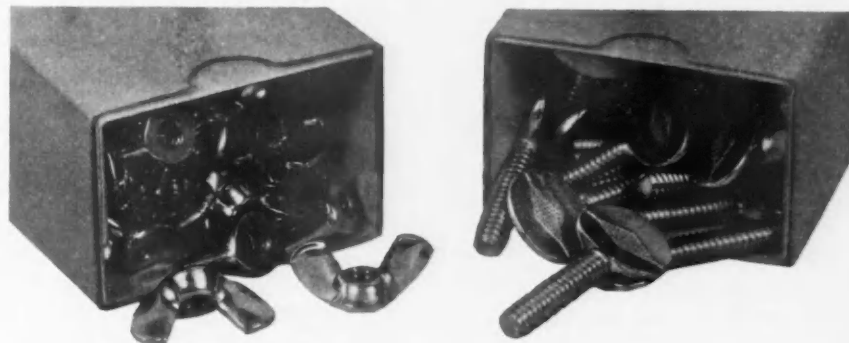
union" has received a degree of government sanction through the President's interpretation of Section 7a. However it is difficult to accept his viewpoint in this because of the explicit statement of the President that the Government does not favor one form of union over another and particularly because of the President's expression favoring the "works council" plan.

Rail Loan Approved For B. & M. R. R.

WASHINGTON, March 27.—The Interstate Commerce Commission yesterday approved an application of the Boston & Maine railroad for a PWA loan of \$1,500,000, to be used for the purchase of 8000 tons of steel rails, and for ballasting and other work.

NEATER-STRONGER

yet You Pay No More—



-for Cold-forged

Wing Nuts and Thumb Screws!

There must be real merit in Parker-Kalon Cold-forged Wing Nuts and Thumb Screws. In a year's time they have become widely preferred over long established wing nuts and thumb screws of the ordinary variety. Only a truly superior product can do that. And such a product deserves your attention . . . when it costs no more. We want to send you free samples. Inspection will show freedom from

flaws, roughness and other imperfections. Cold-forged—by a new and improved process—Parker-Kalon Wing Nuts and Thumb Screws are neat, strong and uniform. Nuts are accurately tapped, and Screws are rolled-threaded to close limits. Use the coupon to get free samples and prices. **RECOGNIZED DISTRIBUTORS** offer prompt delivery.



PARKER-KALON

Cold-forged

WING NUTS AND THUMB SCREWS



—Send for Free Samples!—

PARKER-KALON CORPORATION, 196 Varick Street, New York, N. Y.

Send free samples and prices of ☐ Wing Nuts ☐ Thumb Screws

Name Company

Address

Reconsignment of Shipments Prohibited —Deductions on Railroad Sales Clarified

RECONSIGNMENT of iron and steel products shipped in carload lots to a specific destination is prohibited by commercial resolution No. 49, approved by the directors of the American Iron and Steel Institute on March 15, and effective March 22. The resolution does not apply to less than carload shipments unless in quantities to which carload freight charges apply, nor to shipments sold to the Federal Government or one of its departments or divisions. Violation of the provisions of the code relating to the quoting and billing of delivered prices will apparently be prevented by the resolution.

Computing Allowances on Sales to Railroads

Further clarification of the computation of freight charges and allowances provided in commercial

resolutions 29 and 38 is offered by resolution No. 54, adopted by the institute directors on March 15. The resolution provides that "the rate of any such charge or allowance for the total short-line distance over the line of the purchasing railroad company and the rate of any such charge or allowance for the division or portion of the through published tariff freight charges accruing to carriers other than the purchasing railroad company shall be computed separately per gross ton or per net ton or per 100 lb. according as the price of the product in respect of which such charge or allowance is to be determined is quoted per gross ton or per net ton or per 100 lb. and in each case any fraction of a mill less than one-half in the resulting rate shall be disregarded and any fraction of a mill of one-half or over in such resulting rate shall be increased to one mill."

General Electric's 1933 Profits Off Slightly

THE General Electric Co., in 1933, had profit available for dividends of \$13,429,739, equivalent, after dividends of 6 per cent on special stock, to 38c. a share on 28,845,927 shares of no par value common stock, compared with \$14,404,110, or 41c. a share, on the same number of shares in 1932. Dividends of 60c. a share on the special stock and 40c. on the common stock amounted to \$14,112,633, resulting in a deficit from operations of \$682,894, which was taken from surplus.

According to the company's pamphlet report, orders received during 1933 were \$142,770,791, compared with \$121,725,772 for 1932, an increase of 17 per cent. Orders received exceeded shipments during 1933 for the first time since 1929, so that unfilled orders were greater at the end than at the beginning of the year. Statistics compiled by the Department of Commerce indicated that the company has continued to secure about the same proportion of business available to the industry. Sales billed during 1933 amounted to \$136,637,268, compared with \$147,162,291 for 1932, a decrease of 7 per cent. Billing during the fourth quarter was the largest for any quarter since the second of 1932.

Current assets at the end of 1933 amounted to \$175,314,394, including cash and marketable securities (valued at the lower of par or market) of \$111,878,508, and current li-

abilities were \$13,302,577, a ratio of current assets to current liabilities of 13.2 to 1. This compares with current assets of \$173,691,673, including cash and marketable securities of \$116,108,017, and current liabilities of \$12,869,542 at the end of 1932, a ratio of 13.5 to 1. Current accounts and notes receivable, after deducting reserves, are carried at \$18,370,878, compared with \$17,779,693. Inventories, after deducting reserves, are carried at \$45,467,409, compared with \$41,686,432. The increase is a reflection of increased orders received. Included among other assets at the end of 1933 are restricted funds in closed banks amounting to \$2,750,326, against which reserves of \$1,261,990 have been set up to cover possible losses.

The report reveals that the average number of employees during 1933 was 41,560, compared with 46,943 during 1932, and average annual earnings of these employees was \$1,330 and \$1,308 respectively. Between March 1 and Dec. 31, 1933, 8363 employees were added to the company's payrolls, and the total annual payroll rate increased approximately \$17,448,000.

February Structural Steel Bookings

ALTHOUGH the bookings of fabricated structural steel in February were not up to the volume of the previous month nor to the volume of the last quarter of 1933, the total was 14 per cent larger than for the same month last year. The February book-

ings, however, were 18 per cent less than the bookings for January and 8 per cent less than the average monthly bookings of the last quarter of 1933.

February shipments were 18 per cent less than the shipments of January and 19 per cent less than the shipments of Feb., 1933. This leaves tonnage ahead for future fabrication in a volume approximately 17 per cent larger than this time last year.

These figures are based upon reports received from shops representing 83 per cent of the industry, as reported by American Institute of Steel Construction.

February Employment And Payroll Increase

FACTORY employment and payrolls in the United States showed pronounced gains in February as compared with January, according to the Bureau of Labor Statistics. Employment increased 6.1 per cent over the month interval, and payrolls increased 12.6 per cent. The index of factory employment in February was 73.5, or 4.2 points above the January index of 69.3. The payroll index in February was 55.6 as compared with 49.4 in January.

While increases in both employment and payroll are customary in February, due to the resumption of more regular plant operation after the usual January shutdowns for inventory and repairs, the gains of last month were more pronounced than usual. The average increase in employment in February during the past 10 years has been 1.4 per cent and the average increase in pay rolls over the same interval has been 4.7 per cent.

Comparing factory employment in February, 1934, with February, 1933, the employment index for last month was 27.8 per cent above the level of a year ago, when the index was 57.5. The February, 1934, payroll index compared with that of February, 1933, shows a gain of 52.7 per cent in the amount paid out in factory wages over the 12-month period.

Second \$3,000,000 For Hudson Tunnel

WASHINGTON, March 27.—The Public Works Administration yesterday made its second loan allotment, amounting to \$3,000,000, for construction of the Hudson river tunnel between New York and Weehawken, N. J. It also made a further advance of \$691,000 to the Pennsylvania railroad in connection with the Wilmington-Washington electrification project.

The Texas Corp'n. has purchased five acres of land on the Indiana Harbor Canal, East Chicago, Ind., and will build 500 ft. of docks.

Additional Sales Leads

(Delayed in Mail)

◀ MICHIGAN DISTRICT ▶

Chevrolet Motor Co., 3044 West Grand Boulevard, Detroit, has plans for one-story addition to gear and axle works, Holbrook Avenue. Cost over \$40,000 with equipment. Albert Kahn, Inc., New Center Building, is architect and engineer.

Lewis M. Rishel, Holland, Mich., has purchased former factory of Grobbisel Cabinet Co., Sturgis, Mich., and will remodel for manufacture of hot air furnaces, parts and kindred heating equipment.

Lee Foundry & Machine Co., Mill and Ann Arbor Streets, Plymouth, Mich., plans early rebuilding of part of plant recently destroyed by fire. Loss over \$75,000 with equipment.

Michigan Die-Casting Co., Detroit, has been organized by Louis W. Blauman, 8550 LaSalle Boulevard, and associates, to manufacture die-castings and kindred products.

Briggs Mfg. Co., 11631 Mack Avenue, Detroit, manufacturer of steel automobile bodies, steel sinks, etc., has let general contract to Barton-Malow Co., 1900 East Jefferson Street, for one-story top addition, 85 x 140 ft. Cost over \$65,000 with equipment.

◀ FOREIGN ▶

Ministry of Air, Government of France, Paris, General Victor Denain, minister, is arranging appropriation of 980,000,000 fr. (about \$64,680,000) for purchase of new aviation equipment during 1934 and 1935, including airplanes and parts, field equipment, hangars, repair and reconditioning equipment, etc.

Textile Trust of Soviet Russian Government, Moscow, has approved plans for two mills at Smolensk and Orsha respectively, each to consist of several units with power house, machine shop and other mechanical departments. Cost over \$5,000,000 with machinery. Amtorg Trading Corp., 261 Fifth Avenue, New York, is official buying agency.

Imperial Chemical Industries, Ltd., London, England, will begin superstructure soon for initial unit of new plant at Billingham-on-Tees, England, for production of oil and gasoline from coal. Plant is expected to be completed early in 1935. Cost over \$5,000,000 with machinery.

◀ PACIFIC COAST ▶

Shell Chemical Co., Shell Building, San Francisco, manufacturer of heavy industrial chemicals, an interest of Shell Oil Co., same address, plans additions to plant at Martinez, Cal. Cost over \$400,000 with equipment.

Parker Ice Machine Co., 943 Third Street, San Bernardino, Cal., manufacturer of ice-making and refrigerating equipment, parts, etc., plans new one-story factory. Cost close to \$40,000 with equipment. W. K. Murphy is head.

Bureau of Yards and Docks, Navy Department, Washington, asks bids until April 11 for continuous mechanical blow-down system, including water-softening and chemical feeding system, at Mare Island Navy Yard (Specification 7610).

Golden West Quartz Milling Co., Placerville, Cal., care of George J. Polivka, La Grange, Ill., president, recently organized, plans operation of gold-mining properties near Placerville, with installation of mining, conveying, loading and other equipment, and milling plant. Financing is being arranged for \$100,000, considerable part of fund to be used for purpose noted. John A. Polivka, La Grange, is treasurer.

Roma Wine Co., Lodi, Cal., plans extensions and improvements, including new distillery unit, one-story storage and distribution building, 68 x 110 ft., wire-bound cooperage plant, 60 x 110 ft., fermenting tanks, etc. Cost about \$60,000 with equipment. B. B. Turner is one of heads of company.

Northern Pacific Railroad Co., Smith Tower Building, Seattle, with main offices at St. Paul, Minn., is considering extensions and improve-

ments in engine house and shop at local yards, including installation of new turntable, tools, etc. Cost about \$75,000 with equipment.

Bureau of Supplies and Accounts, Navy Department, Washington, asks bids until April 6 for one frequency changer (Schedule 2026-R) for San Diego Navy Yard; until April 10, soot blower units and spare parts (Schedule 2004) for Puget Sound yard; two 150-hp. Diesel engines and spare parts (Schedule 2009) for Mare Island and Puget Sound yards.

City Light and Power Department, Seattle, will begin work soon on Skagit River hydro-electric power development, including new generating plants at Ruby Diablo sections, transmission lines, substations and other struc-

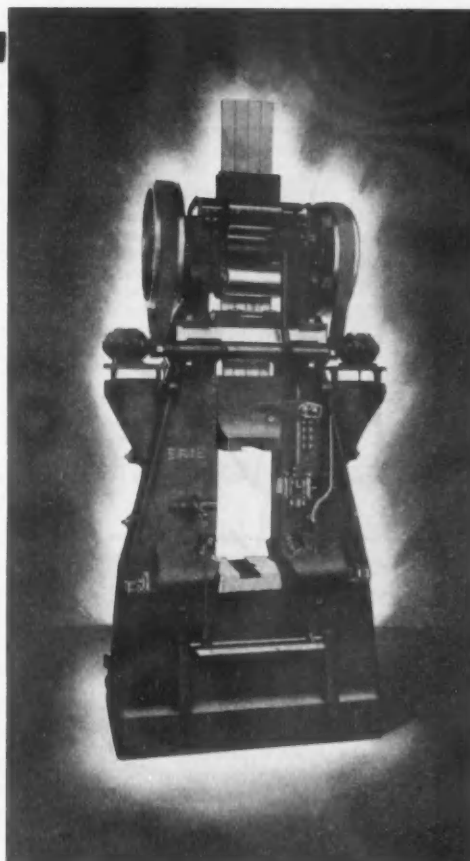
tures. Appropriation of \$13,000,000 has been secured through Federal aid. J. D. Ross is superintendent of department.

Rose City Brewing Co., Woodlawn district, Portland, T. J. Schmidt, president, plans extensions and improvements, including new equipment. Cost about \$35,000.

American Petrometal Corp. has leased property at Broadway, Eleventh and Twelfth Streets, Long Island City, N. Y., with steel warehouse and office buildings, and will operate on a wholesale basis, selling merchant bars, structural shapes, plates, reinforcing bars, special sections, and complete line of domestic sheets and cold rolled steel.

Steel Chairs.—Lyon Metal Products, Inc., Aurora, Ill. Bulletin describing straight and curved seat folding steel chairs. Upholstered models, with and without arms and with rubber feet, are available.

Was Your Face Red?



Were you embarrassed when your best customer asked to go through your shop and see your equipment for making drop forgings? Did you know he would get a bad impression, that he would realize that deliveries from you were likely to be delayed by failure of worn-out hammers, that he would see that you couldn't quote the right prices, making his work on obsolete machines?

Your pride and your business judgment wouldn't let you drive up to your customer's office in an antiquated automobile; but a 1918 motor car is just as sensible as twenty-year-old hammers and presses. Install Improved Erie Forge Shop Equipment, and see how the customer's confidence in your judgment is increased.

ERIE FOUNDRY COMPANY ERIE, PENNA., U. S. A.

DETROIT:
CHICAGO:

335 CURTIS BUILDING
549 WASHINGTON BLVD.

INDIANAPOLIS: 335 POSTAL STATION BUILDING
PARIS, FRANCE: 8 RUE DE ROCROY

ERIE

Common Sense Applied Price Levels

(Concluded from Page 18)

The inference in the editorial is further invalidated by the fact that it is based not on steel prices, but on those for "metals and metal products" which include not only fabricated iron and steel products, but all the non-ferrous metals (copper, zinc, tin, etc.) the prices of which have in most cases fallen in the depression far more than have the ferrous metals.

The inference here is that THE IRON AGE has been unfair in assuming that the group is representative of the sub-group. We must admit

Trade Commission were sound, we would find the indices of iron and steel, during the deflation years, above, not below the index of the group of which it is a component part.

Finally, THE IRON AGE is condemned by the commission for not taking account of technological improvement as a price factor. To quote from the commission's report:

Criticism of the price practices and price structure for steel is not answered by a showing that the average prices of

try can you find a similar 34-year record of passing the fruits of technological development along to consumers, as in group (f) of this chart? The very fact that the Federal Trade Commission has not been cognizant of this situation, as is evident from its remarks, is proof indeed that industry needs protection from misinterpretation by insufficiently informed Government spokesmen.

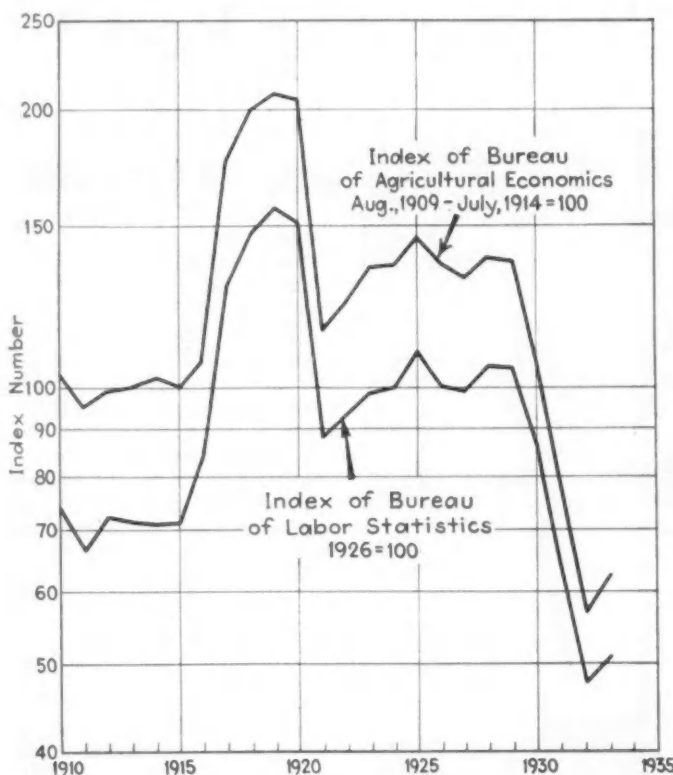
In Conclusion, "So What?"

After all this is said, what should we do about it?

We cannot expect that price levels should be equalized on even the long term 1900-1915 basis, for in 20 years we must expect logical differences in even group alignment to take place. Mechanization, for example, may have proceeded faster in one group than in another.

We cannot, in fairness, claim that farm prices need no greater boost than do metals and metal-products prices. For though statistics may show that farm prices have suffered no greater deflation, the steel and metal-working industry will readily admit the need of preferential treatment for the farmer in the matter of price rises.

There is, in fact, perhaps no moral to this statistical tale, and yet it has a purpose. Its purpose is to show the fallacy of price planning on the basis of commodity price indices and to confute the loud and oft-repeated assertions of correspondence school economists and others that iron and steel prices have been and are too high. According to this showing and the more convincing one of almost universal deficits among the producers, the reverse is true.



Base Prices and Realized Prices Are Closely Synchronized.

This is evident from a comparison of farm prices based on Department of Labor statistics (wholesale prices) with prices received for farm products by farmers, as computed by the Bureau of Agricultural Economics. This is a logarithmic chart in which parallelism indicates equal rates of change.

this unfairness, but it has been unfairness in a direction opposite to that implied by the commission. We have penalized iron and steel in this matter, for the indices of this sub-group have consistently, year after year since 1926, been below the annual indices of the metals and metal products group. The record, from the Bureau of Labor statistics follows:

Year	Index of Metals and Metal Products	Index of Iron & Steel Sub-Group
1926	100	100
1927	96.3	94.2
1928	97.0	93.5
1929	100.5	94.9
1930	92.1	89.1
1931	84.5	83.3
1932	80.2	79.4
1933	79.8	78.6
1934 (Jan.)	85.5	83.6

If the argument of the Federal

steel have in twenty years fallen slightly more than those in agriculture (even if the average prices were real prices and comparable, which they are not). The position taken assumes that the price averages of different great industries ought to change at the same rate and in the same degree. The last twenty years were marked by unprecedented technological improvements in chemistry, physics, engineering, metallurgy, electricity, etc. The percentages of decrease claimed ignore the question whether the industry has passed on to the public in the form of lower prices, a full and fair share of the fruits of that progress.

I believe that all that is necessary to prove to any unbiased reader's satisfaction that the metal-working industry has passed on to the consumer the fruits of its technological advances is to call attention to the chart at the top of page 17 of this issue. In what other group in indus-

Participate in Bridge Design Competition

SIXTY-TWO students representing 24 colleges in the United States participated in the sixth annual students' bridge design competition of the American Institute of Steel Construction. A jury of nationally known engineers and architects selected the 10 best from the preliminary drawings for entry into the final judging to be held on May 3. All the entrants in the competition are actively engaged in studying engineering or architecture.

The problem is the design of a steel tower for a small highway suspension bridge, the main span of which is 500 ft.; the cable sag at mid-span 60 ft.; side spans each 240 ft. from center of towers to anchorage connections; clear roadway width of 30 ft.; elevation of the underside of roadway at towers 50 ft. above water level, and top of masonry piers 10 ft. above water level.

TRADE PUBLICATIONS

Welding Equipment.—Westinghouse Electric & Mfg. Co., East Pittsburgh. New line of spot and projected welding equipment for manual and motor operation as described in illustrated leaflet, which presents the distinctive features, construction, operation and application of equipment.

Magnaflux.—A. V. de Forest Associates, New York. Rapid, non-destructive method of locating defects in steel and magnetic alloys. Attractive folder showing methods of application and results obtained in detecting surface and subsurface flaws in variety of different objects.

Furnace Insulation.—Johns-Manville Corp., New York. Treatise describing insulation methods which have proved most effective in improving performance and reducing operating costs on all types of industrial furnaces and ovens. Scores of drawings and photographs are used to show equipment requirements and recommended treatments.

Steel Making.—Inland Steel Co., Chicago. Booklet telling complete story of process of making steel. Illustrations are used, and language is non-technical.

Controlled Atmosphere Furnaces.—Surface Combustion Corp., Toledo, Ohio. Pamphlet describing heating, annealing, nitriding, and carburizing of products in continuous and controlled atmosphere furnace. Presentation of various processes is non-technical and inclusive.

Bakelite Moulding.—Bakelite Corp., Bound Brook, N. J. Clear and concise booklet showing procedure and latest achievements in Bakelite molding materials. Book is replete with illustrations, fully presenting best methods of molding art.

Automatic Furnaces.—Parker-Kalon Corp., New York. Booklet describing Hyro automatic furnace primarily described for cyaniding, but equally useful for heat treatment by other salts, and by lead, oil or any other liquid bath. High efficiency, safety, and uniformity are claimed by the makers.

Aluminum Welding.—Aluminum Co. of America, Pittsburgh. Booklet fully illustrated and containing technical information concerning welding of various aluminum products.

Tramrail Installations.—Cleveland Crane & Engineering Co., Wickliffe, Ohio. Folder complete with illustrations showing varied industrial uses of tramrail installations.

Ni-Cr Alloy Steels.—American Manganese Steel Co., St. Louis. Folder describing physical characteristics of six different Amsco alloys suitable for parts which must resist heat, corrosion or acids.

Industrial Research.—Metropolitan Life Insurance Co., New York. Complete dissertation on organization of research departments, with data from 45 different companies. Forms are presented for estimating labor, overhead, and material costs, and whole manuscript is concerned with proper balance of operating budget and laboratory performance.

High Manganese Steels.—Union Drawn Steel Co., Massillon, Ohio. Folder describing physical properties and applications of cold drawn high manganese, open-hearth, free machining steels.

Die Steel.—Firth-Sterling Steel Co., McKeesport, Pa. Folder giving information concerning Cromovan Triple Die Steel. Heat treatment, forging, hardening, and annealing procedures and characteristics are fully discussed.

Bulk Handling by Belt.—Chain-Belt Co.,

Milwaukee. Folder describing the construction and applications of continuous belts for handling of various types of bulk material.

Machine Molded Gears.—Poole Foundry & Machine Co., Baltimore. Complete catalog listing all sizes, types, and kinds of machine molded gears.

Electric Flow Meters.—Brown Instrument Co., Philadelphia. Folder with data describing electric flow meters for use in regulating steam flow to control costs and efficiency.

Synchronous Motors.—Allis-Chalmers Mfg. Co., Milwaukee. New bulletin describing line of bracket bearing synchronous electric motors. Discussion is included concerning improvement of power factor with examples applying graphical method for figuring power factor corrections. Description of standard line of motors for general requirements is included.

Electric Motors.—Louis Allis Co., Milwaukee. New bulletin showing detailed construction and characteristics of different types of motors.

Ventilation.—Swartwout Co., Cleveland. Folder presenting need of adequate ventilation for worker efficiency, and showing usefulness of correct controls on steam, air, and water lines.

Bearings.—Fafnir Bearing Co., New Britain, Conn. Condensed catalog combining complete information and data on industrial uses of radial ball bearings as well as Fafnir power transmission line of wide inner rings and ball bearings.

Steel Castings.—Sivyer Steel Casting Co., Chicago. New booklet showing melting and production methods for carbon and alloy steel castings.

Centrifugal Pumps.—Morris Machine Works, Baldwinsville, N. Y. Bulletin describing line of double suction horizontally split centrifugal pumps. Also includes outline of important advances in pump design within recent years together with illustrations regarding construction of various types of pumps.

Pumping Unit.—Ingersoll-Rand Co., Phil-

lipsburg, N. J. Booklet illustrating construction and uses of units with self priming attachments making them useful as sump or gathering pumps in mines. Table of capacities and performance data is included.

Blast Furnaces.—Freyn Engineering Co., Chicago. Booklet showing blast furnace design and construction methods. Includes large section concerning steel mill equipment.

Pipe Threading.—National Tube Co., Pittsburgh. Bulletin No. 6, entitled "Pipe Threading Principles," is comprehensive treatise on pipe threading practice. Many line drawings, illustrations, and tables are included.

Sheet Mill Equipment.—Westinghouse Electric & Mfg. Co., East Pittsburgh. Illustrated leaflet describes electrical equipment for automatic roller and catcher tables in sheet mills.

FINANCIAL NOTES

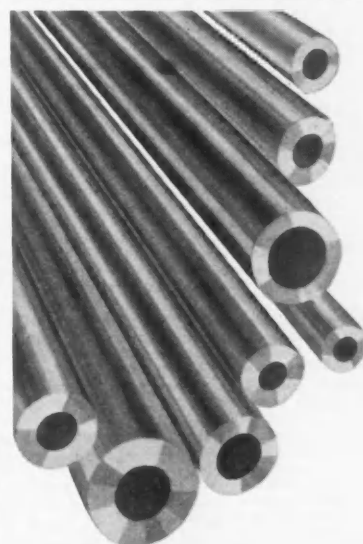
United States Pipe & Foundry Co., Burlington, N. J., reduced its deficit cut from \$1,273,054 in 1932 to \$71,453 in 1933. Current assets were \$13,505,444 and current liabilities \$855,542, as of Dec. 31, 1933.

American Locomotive Co. and subsidiaries, New York, had 1933 loss of \$1,465,504 after deducting depreciation and all other charges. Unfilled orders on Jan. 1, 1933, amounted to \$3,500,782, compared with \$1,079,891 one year before.

Detroit Gray Iron Foundry Co., Detroit, had net profit of \$22,534 in 1933, after provisions for all reserves.

Westinghouse Air Brake Co. operated in 1933 at net loss of \$659,560, after all expenses, depreciation and taxes. For the preceding year the company had shown net income of \$1,421,247.

Spang, Chalfant & Co., Inc., subsidiary of National Supply Co., sustained net loss for 1933, after charges, of \$910,692, compared with net loss of \$900,969 in 1932.



TOOL STEEL TUBING

NON-SHRINK
OIL HARDENING
NON-DEFORMING

for RING DIES
CUTTING DIES
SPACERS, BUSHINGS, Etc.

Manufacturers of BISCO Tungsten Carbide
drawing dies for wire, rod and tubing.

THE BISSETT STEEL CO., INC.
945 E. 67th ST. CINCINNATI
Worcester Bufile

PLANT EXPANSION AND EQUIPMENT BUYING

Foreign Credit Situation Bothers U. S. Tool Builders

MACHINE tool builders in Cincinnati and elsewhere have been spending some anxious moments during the past week in connection with the credit situation confronting an important French company that recently placed large orders in this country. Makers indicate the expectation that this situation will shortly be cleared up but in the meantime releases on shipments are being withheld.

President Roosevelt's success in averting the expected strike of automotive workers has brightened the machine tool outlook perceptibly from the standpoint of domestic expectations. It is believed that with his

assurance to industry of a fair interpretation of Section 7-a, the automobile makers will resume their plans for extensive retooling.

National Machine Tool Builders' Association reports its February index of machine tool orders as 86.4 as compared with an index of 101.7 in January of this year. The difference is attributed to the slowing down of domestic business. Foreign orders in February, according to the Association, represent 25 per cent of the total, which is a little better than in January.

Current machine tool business remains dull this week with small orders predominating.

(Contract No. 56), and for boilers, stokers and auxiliary equipment (Contract No. 57) for municipal waterworks. A. R. O'Reilly is chief engineer.

New Jersey-Delaware Brewing Co., Fifth and Adams Streets, Wilmington, Del., recently organized, has taken over former plant of Stoeckle Brewery, and will expand for new brewery. Cost over \$100,000 with machinery. Victor E. Ullman is president.

◀ NEW ENGLAND ▶

White Fuel Corp., 888 East First Street, South Boston, is revising plans for new coal-handling plant. Cost about \$70,000 with equipment. George P. Carver, 62 Dane Street, Beverly, Mass., is architect.

Bureau of Supplies and Accounts, Navy Department, Washington, asks bids until April 3 for 20 pressure reducing air valves and spare parts (Schedule 2006) for Portsmouth, N. H., Navy Yard; five motor-driven turret lathes (Schedule 2038), and until April 6 for three motor-driven automatic screw machines (Schedule 2045) for Newport, R. I., Navy Yard.

Croft Brewing Co., Roxbury, Boston, plans addition for brew-house, with installation of brewing and other machinery. Company has acquired additional property at 148-50 Terrace Street for expansion. Cost over \$100,000 with equipment. Arrangements have been made for acquisition of Bismarck Brewing Co. plant, Baltimore, for new branch plant at that place. Improvements will be made in latter brewery. Rudolph P. Bischoff is president.

Pneu Way Tools, Inc., Boston, has been organized by Robert J. Holmes and Dagmar A. Miller, 125 Lovell Road, Watertown, Mass., to manufacture tools and kindred equipment.

David Hayes, 38 Victoria Road, Hartford, Conn., is at head of project to erect a new brewery at Hebron, Conn., where former mill of P. W. Turner Silk Co., on 6-acre tract, has been purchased. New units will be built and present structures remodeled. Cost over \$80,000 with machinery.

Flash Heater Co., Hartford, Conn., has been formed by William M. Hills and Antonio D. Eulo, 16 Vernon Street, to manufacture gas-water heaters and parts.

◀ OHIO AND INDIANA ▶

Euclid Brewing Co., Cleveland, recently organized, care of A. E. Keller, 2570 Overbrook Road, architect, is arranging financing for three and four-story plant, 110 x 180 ft., on Euclid Avenue. List of equipment to be installed is being arranged. Cost about \$350,000 with machinery.

Fisher Body Corp., East 140th Street and Coit Road, Cleveland, headquarters in Detroit, is considering another one-story addition, about 200 x 400 ft. Cost over \$125,000 with equipment. As recently noted, company has let general contract to J. A. Utley, Penobscot Building, Detroit, for one-story addition to Cleveland plant, 86 x 100 ft., for storage and distribution, to cost about \$40,000 with equipment.

Pressure Castings, Inc., Cleveland, has been organized by Nelson F. Jacobs and William R. Rosenfeld, 824 Leader Building, to manufacture iron and other metal castings.

Sullivan Machinery Co., 400 North Michigan Avenue, Chicago, manufacturer of mining machinery, parts, etc., has purchased plant and assets of Joy Brothers, Inc., Marion, Ohio, manufacturer of heavy saws and kindred equipment. Marion works will be removed to branch plant of purchasing company at Claremont, N. H., where operations for production of coal saws and allied equipment will be expanded.

Contracting Officer, Material Division, Wright Field, Dayton, Ohio, asks bids until

◀ NORTH ATLANTIC ▶

Atlantic Refining Co., 260 South Broad Street, Philadelphia, plans new bulk oil storage and distribution plant on State Barge Canal, Albany, N. Y. Cost close to \$70,000 with tanks, pumping machinery and other equipment.

Diamond Steel Products Corp., 255 Russell Street, Brooklyn, has leased one-story building at 86 Quay Street for new plant.

Franson Welding Service, Inc., Brooklyn, has been organized by Eric Franson and associates, to operate a welding and repair works. New company will take over organization of same name at 1221 Thirty-ninth Street.

Macklett Laboratories, Inc., Long Island City, manufacturer of X-ray tubing and equipment, has purchased factory of Segal Metal Products Co., Stamford, Conn., for new plant, and will remove to new location in April.

Arkay Co., 335 West Sixteenth Street, New York, manufacturer of kitchen equipment, etc., has leased floor in building at 215 East Twenty-second Street for new plant.

Horton Pilsener Brewing Co., Inc., 460 West 128th Street, New York, has plans for addition to storage and distributing units. Cost about \$35,000 with equipment. F. A. Rooke, 12 East Forty-first Street, is architect.

Pelham Razor Corp., New York, has been formed by Thomas W. Pelham, 115 Central Park West, and Thomas W. Pelham, Jr., 299 West Twelfth Street, capital \$75,000, to manufacture razors, razor blades, etc.

Interboro Beverage Corp., 193 Melrose Street, Brooklyn, has filed plans for extensions and improvements in five-story storage and distribution plant at 24-26 George Street. Cost about \$25,000 with equipment.

Surgical Instrument Research Laboratory, Inc., New York, recently organized to manufacture surgical instruments, etc., has leased space in Starrett-Lehigh Building, West Twenty-sixth Street and Eleventh Avenue, for new works.

Rubel Corp., 937 Fulton Street, Brooklyn, operating ice-manufacturing plants, brewery and other industries, has filed plans for ex-

tensions and improvements in three-story building at 401-11 Bond Street, for new brewery unit. Cost over \$30,000 with equipment. Company will also build one-story oil storage and distribution plant at 14-18 India Wharf. Cost \$150,000 with equipment. Alfred H. Eccles, 29-09 Bridge Plaza North, Long Island City, is architect for both projects.

Mechanical Products Corp., New York, has been organized by Isaac Fleer, 1744 Monroe Avenue, Bronx, and I. B. Rosenberg, 217 North Regent Street, Port Chester, N. Y., to manufacture tools and other mechanical equipment.

Gas Generator Corp., 145 East Forty-first Street, New York, manufacturer of gas-generating equipment, parts, etc., is arranging for stock issue of \$500,000, part of fund to be used for expansion.

Metal Welding Co., Broad and Clay Streets, Newark, N. J., has leased one-story building at 310-12 Ogden Street for new plant.

Molten Metalizing Corp., Hoboken, N. J., has been organized by Kenneth B. Kennedy and Howard C. Evans, 1210 Grand Street, to manufacture metal products.

Joseph Krieg-Fink Co., North Bergen, N. J., has leased one-story building at 929 Thirty-ninth Street, about 12,000 sq. ft. floor space, for new liquor blending and rectifying plant.

Joseph L. Donahay, Freehold, N. J., is at head of project to establish a new local distillery. Former canning plant of Joseph Brakeley Co. will be taken over and remodeled for plant. Cost over \$30,000 with equipment.

Jacob Hornung Brewing Co., 3111 North Twenty-second Street, Philadelphia, has let general contract to Frank L. Wints, 1618 North Twenty-seventh Street, for extensions and improvements in plant unit. Cost about \$25,000 with equipment.

Ridley Township School Board, Rutledge, Pa., plans manual training department in new multi-story senior and junior high school. Bids will soon be asked on general contract. Cost over \$175,000. Scholl & Richardson, Reading, Pa., are architects.

Bureau of Water, Reading, Pa., John M. Seasholtz, purchasing agent, asks bids until April 4 for centrifugal pumps, vacuum pumps, air compressors and accessory equipment

To Production Executives



Sunoco Helps You Secure ..Rated Machine Tool Capacity ..at Minimum Cost

IN your efforts to lower machining costs, don't overlook the real importance of an efficient cutting lubricant. Without it, machine tools will not operate at rated capacity. And it is significant that machine tool manufacturers use and recommend Sunoco Emulsifying Cutting Oil.

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With the aid of Sunoco, many executives have definitely increased machine hour production. Faster and deeper cuts are possible. Work is kept cooler. Accuracy and finish, even at higher speeds, are kept at the same high plane. Longer runs between tool grinds and less lost time for re-setting, too, make for economy.

The ability to estimate the production capacities of cutters, drills, taps, reamers and other small tool equipment, is a valuable aid in computing manufacturing costs. The uniformity of Sunoco permits accurate prediction on the quantity of work that machine tools will produce.

It will pay you to get the facts on Sunoco. Tests in your plant will gladly be made, and our experienced cutting oil engineers are at your service.

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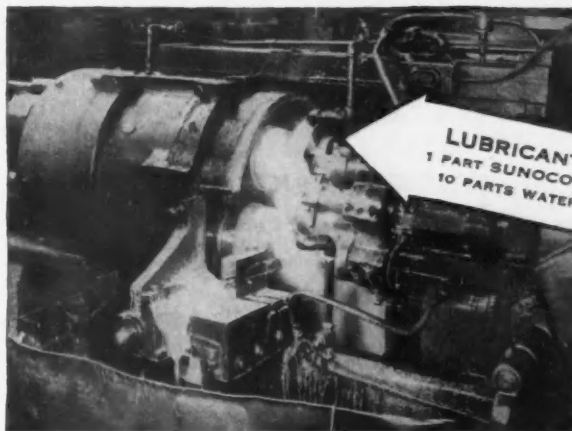
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COOLANT:
1 PART SUNOCO TO
50 PARTS WATER

Courtesy of **MUSKEGON MOTOR SPECIALTY Co.**
Jackson, Mich.

OPERATION: FINISH GRIND, CRANKSHAFT CENTER
MAIN BEARING, PLUNGER CUT.
MACHINE: LANDIS GRINDER.
MATERIAL: H. R. TYPE "E. E." STEEL.
SPINDLE SPEED: 750 R.P.M.
WHEEL SIZE: 30 INCH DIAM., 2.188 INCH FACE.
STOCK REMOVAL: .025 INCH.
PRODUCTION: 40 PER HOUR



LUBRICANT:
1 PART SUNOCO TO
10 PARTS WATER

Courtesy of **NATIONAL ACME Co.,** Cleveland, Ohio

OPERATION: ROUGH BORE AND ROUGH TURN STEEL
FORGING.
MACHINE: GRIDLEY 4-SPINDLE, 4½ INCH CHUCKING
MACHINE.
SPINDLE SPEED: 160 R.P.M.
BORE: 129 FEET PER MINUTE.
TURN: 114 FEET PER MINUTE.

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Subsidiary Companies: Sun Oil Co., Ltd., Montreal
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April 3 for fasteners and snap fastener assemblies (Circular 373), steel wire casting brushes, scratch brushes, etc. (Circular 357), clevis, turnbuckle, cable eyes, flat head pins, conduit nuts, etc. (Circular 379); until April 4, 20 tail wheels (Circular 381); until April 5, ball and roller bearings and roller bearing assemblies (Circular 384), valve caps, valve stem assembly extensions, etc. (Circular 393).

Village Council, Cardington, Ohio, plans installation of pumping machinery and auxiliary equipment, pipe lines, etc., for municipal water system. Cost \$66,700. Financing is being arranged. Jennings & Lawrence, 12 North Third Street, Columbus, Ohio, are engineers.

Joseph E. Seagram & Sons, Inc., Lawrenceburg, Ind., a subsidiary of Distillers Corp.-Seagram's, Ltd., Montreal, has awarded general contract to J. & E. Warm Co., Ingalls Building, Cincinnati, for ten-story storage and distributing plant at local distillery, 150 x 250 ft. Cost about \$300,000 with equipment.

Piel Brothers Starch Co., 1515 South Drovers Street, Indianapolis, has asked bids on general contract for addition, primarily for grain storage and distribution. Cost over \$65,000 with bins, elevating and other mechanical-handling equipment. O. A. Tislow, Architects' & Builders' Building, is engineer.

◀ WESTERN PENNA. ▶

Valvoline Oil Co., Butler, Pa., has begun expansion and improvements at oil refinery at East Butler, to include new stills, tanks, pumping machinery and other equipment. Cost close to \$400,000 with equipment. Headquarters are in Carew Tower Building, Cincinnati.

United States Engineer Office, Pittsburgh, asks bids until April 3 for two air-driven tow haulage engines with accessories (Circular 133).

Davis-Himes Printing Co., Altoona, Pa., plans rebuilding part of plant recently destroyed by fire. Loss about \$50,000 with equipment.

Common Council, Rivesville, W. Va., plans installation of 150,000-gal. steel storage tank, pipe lines, etc., for extensions and improvements in municipal water system. H. L. Scott, Fairmont, W. Va., is engineer.

Pittsburgh Wax Paper Co., Pittsburgh, organized to manufacture waxed and other processed papers, has leased property at Twenty-eighth and Railroad Streets and plans erection of one-story plant, about 34,000 sq. ft. floor space. Cost about \$45,000 with equipment.

Hillman Coal & Coke Co., First National Bank Building, Pittsburgh, has approved erection of new tippie at Naomi coal mine, near Fayette City, Pa., to replace a unit destroyed by fire several months ago. Cost over \$25,000 with equipment.

◀ WASHINGTON DISTRICT ▶

Board of District Commissioners, District Building, Washington, asks bids until April 2 for 167,200 lb. steel rails and traffic signal control equipment.

Acme Distilleries, Inc., Baltimore, has leased four-story building at 723-25 West Pratt Street for new blending and rectifying plant.

Commanding Officer, Aberdeen Proving Ground, Aberdeen, Md., asks bids until April 2 for two underfeed stokers, to be used with 300-hp. boiler units (Circular 50).

Mexican Emulsion Co., East Brooklyn, Baltimore, affiliated with Mexican Petroleum Co., same address, with headquarters at 122 East Forty-second Street, New York, plans new bulk storage and distribution plant, with steel tanks, motor-driven pumping machinery and other equipment. Cost over \$45,000 with machinery. F. L. W. Moeble & Associates, 201 West Franklin Street, are engineers.

Chemical Warfare Service, Edgewood Arsenal, Md., asks bids until April 3 for hexagon brass fusible safety plugs and brass pipe valves (Circular 43), and one dry cleaning machine (Circular 41).

Bureau of Supply, Procurement Division, Treasury Department, Washington, asks bids until April 5 for turnbuckles (Class 12), bearings, bearing balls, barrel bolts, brackets, key blanks, locks, track spikes, door springs, sash weights, barb wire, etc. (Class 42), for July-December period.

Bureau of Supplies and Accounts, Navy Department, Washington, asks bids until April 3 for rivets, washers and burrs (Schedule 1996); until April 6, bolts, barrels, screw eyes, etc. (Schedule 1213) for Eastern and Western Navy yards.

◀ BUFFALO DISTRICT ▶

Kimberly-Clark Corp., Packard Road, Niagara Falls, N. Y., manufacturer of paper products, with main mill at Neenah, Wis., has plans for new five-story storage and distributing building at local plant, 83 x 200 ft. Cost over \$75,000 with equipment.

Wagner Electric Corp., 1796 Main Street, Buffalo, manufacturer of electrical equipment, hydraulic brake products, etc., with main plant at St. Louis, has leased building at 1587-89 Main Street for new local factory branch and service division.

Stoker Equipment Co., Inc., Rochester, N. Y., has been organized by J. Emmett O'Brien, 92 San Gabriel Drive, and Fred Forman, 2325 East Avenue, to manufacture stokers, parts and kindred equipment. Company will take over organization of same name at 49 South Avenue.

Canadian Industries, Ltd., Montreal, will soon begin work on initial units of new plant at Cornwall, Ont., for manufacture of alkali, caustic soda and kindred products. Cost about \$800,000 with equipment. Robert Salmon is general manager of chemical department.

◀ SOUTH ATLANTIC ▶

Department of Public Service, Miami, Fla., William Sydow, director, asks bids until April 11 for equipment for municipal water system, pipe lines, fittings, etc. Fund of \$560,000 has been arranged for work.

Common Council, Belhaven, N. C., plans new municipal electric light and power plant. Cost about \$50,000 with equipment. Financing is being arranged.

Construction Service, Veterans' Administration, Washington, asks bids until April 10 for wrought iron and wire fencing and gates, for institution at Columbia, S. C.

Optic Liquid Measure Corp., Norfolk, Va., has been organized, capital \$50,000, by W. L. Parker, Bank of Commerce Building, and associates, to manufacture liquid measuring equipment and devices.

Gossett Machine Works, Inc., Gastonia, N. C., has been organized by B. W. Gossett, Gastonia, and associates, capital \$40,000, to manufacture equipment and parts, including textile mill machinery.

◀ SOUTHWEST ▶

United States Engineer Office, Missouri River Division, Postal Telegraph Building, Kansas City, Mo., asks bids until April 4 for electrical distribution system at Fort Peck construction camp, Fort Peck dam and hydro-electric power project, near Glasgow, Mont. (Circular 57); until April 9 for 16 motor-driven reversing anchor winches (Circular 63).

M. K. Goetz Brewing Co., Sixth and Albenmarle Streets, St. Joseph, Mo., will take bids soon on general contract for new multi-story plant on 5-acre tract at Kansas City, Mo., recently acquired. Cost over \$450,000 with equipment.

Ozark Barrel & Body Corp., West Helena, Ark., care of Frederick J. Riker, Helena, Ark., president, recently organized, plans factory for manufacture of wire-bound barrels, automobile bodies, etc. Company is arranging financing in amount of \$1,600,000, part of fund to be used for purpose noted. A. H. Coates, Helena, is secretary and treasurer.

City Council, Monett, Mo., has plans for new municipal electric light and power plant. Cost about \$148,500. Financing is being arranged. Burns & McDonnell Engineering Co., 107 West Linwood Boulevard, Kansas City, Mo., is consulting engineer.

Board of Education, Webster Groves, Mo., Frank L. Wright, president, asks bids on general contract until April 9 for new three-story and basement junior high school, to include manual training department. Cost about \$250,000. William B. Ittner, Inc., Continental Life Building, St. Louis, is architect.

Monitor Gold Mining Co., Amarillo, Tex., care of J. F. Bromert, Amarillo, president, recently organized, plans operation of gold properties, with installation of mining, elevating, conveying and other equipment, and milling plant. Project will include an electric power plant. Company is arranging financing for \$750,000, considerable part of fund to be used for purpose noted. R. J. Booth, Amarillo, is secretary and treasurer.

City Council, Seguin, Tex., asks bids until April 4 for extensions and improvements in municipal hydroelectric power plant, including waterwheel and generator, with accessory equipment, pumping machinery, water-cooling system, etc. H. N. Tully, Seguin, is consulting engineer.

◀ SOUTH CENTRAL ▶

Mississippi Power Co., Gulfport, Miss., plans rebuilding part of car house and shop at Laurel, Miss., recently destroyed by fire. Loss about \$75,000 with equipment.

Department of Public Works, City Hall, Junction City, Ky., plans installation of pumping machinery and accessories, pipe lines, etc., for new municipal water system. Cost about \$52,000. Financing has been arranged.

Bernheim Distilling Co., Louisville, has begun work on expansion and improvements at two local plants on adjoining sites, to include erection of additions to fermenting units and other structures, with increase in storage and distribution departments. Cost over \$100,000 with machinery.

Watson Pump & Supply Co., Memphis, Tenn., has been organized by H. A. Watson, Whitehaven, Tenn., and associates, to manufacture pumping equipment and parts.

Sam Stone, Jr., Masonic Temple Building, New Orleans, architect, is making surveys and plans for new brewery at Vicksburg, Miss., for company to be organized by Harry Leyens, Vicksburg, and associates. Cost over \$75,000 with equipment. Henry A. Mentz, Hammond, La., is consulting engineer.

◀ MIDDLE WEST ▶

Graham Brothers Distillery, South Main Street, Rockford, Ill., has let general contract to Fischer Construction Co., Rockford, for extensions and improvements. Cost over \$70,000 with machinery.

School District No. 18, Madison County, Highland, Ill., T. W. Ewing, school superintendent, plans manual training department in new multi-story high and grade school. Cost about \$190,000. Knoebel & Pabst, 4908 Delmar Boulevard, St. Louis, are architects.

Marvel Metal Products Corp., 38 South Dearborn Street, Chicago, has been organized by Norvin H. Franks and Walter Taylor, to manufacture metal goods.

City Council, Detroit Lakes, Minn., asks bids until April 2 for equipment for municipal steam power plant, including coal-handling machinery, combustion control equipment, draft gages, boiler meters, etc. Charles Foster, Sellwood Building, Duluth, Minn., is consulting engineer.

Southern Nebraska Power Co., Superior, Neb., plans rebuilding part of power plant at Oak, Neb., recently destroyed by fire. Loss about \$100,000 with equipment.

Campbell Machine Co., 2845 Harriet Avenue, Minneapolis, has let general contract to Britton H. Goetze, 4608 Drexel Avenue, for two-story addition, 40 x 85 ft. Cost about \$25,000 with equipment. C. F. Campbell, address noted, is company architect.

Common Council, Manning, Iowa, is completing financing in amount of \$135,000 for new municipal electric light and power plant. Burns & McDonnell Engineering Co., 107 West Linwood Boulevard, Kansas City, Mo., is consulting engineer.

Common Council, Ekalaka, Mont., plans installation of motor-driven turbine pumping unit and accessories, pipe lines, fittings, etc., for municipal water system. Fund of \$35,300 has been arranged. Roy N. Stewart, Miles City, Mont., is consulting engineer.

Lewistown Brewing Co., Lewistown, Mont., recently organized, has taken over former local brewery and will remodel. Brewhouse, bottling, conveying, loading and other equipment will be installed. Cost about \$45,000. Gustav Hodel is president.

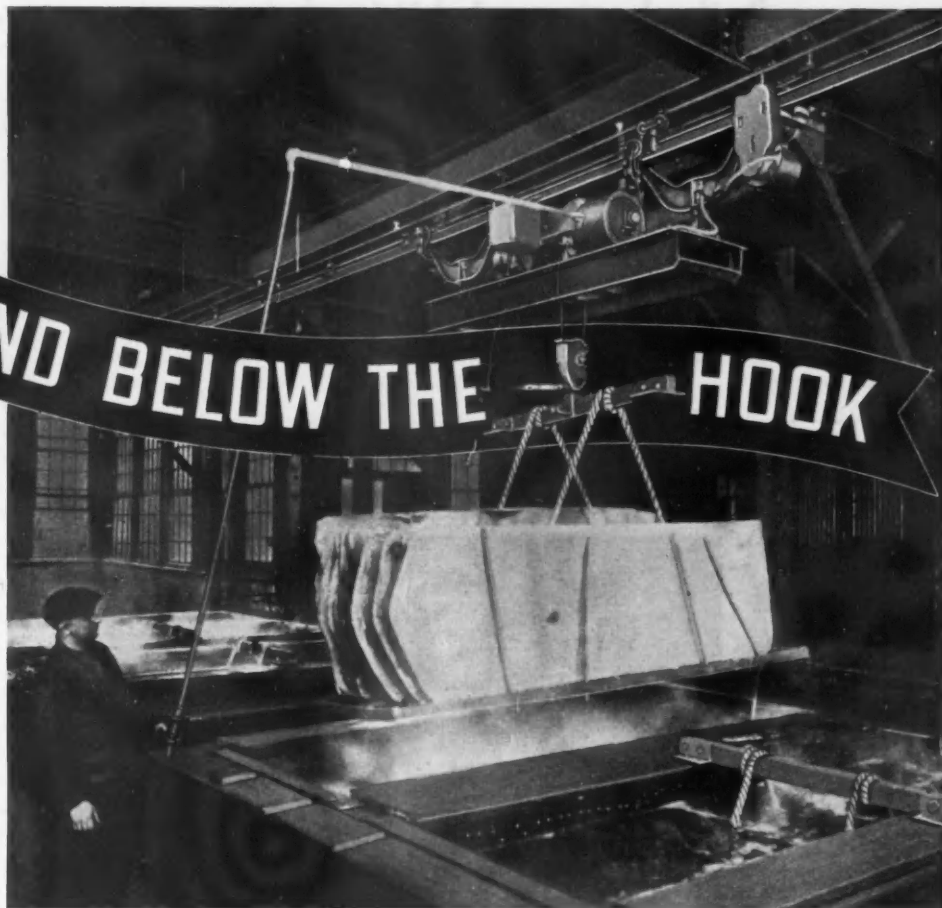
City Council, Forsyth, Mont., has plans for new municipal electric light and power plant, using Diesel engine-generating units, and street-lighting system. Fund of \$141,900 is being arranged for project. F. F. Palmer is city engineer.

Hurley Machine Co., Chicago, manufacturer of household utilities, has purchased buildings and equipment of Meadows Mfg. Co., Bloomington, Ill., in receivership for about two years. Meadows company formerly manufactured electric and gasoline washing machines.

National Pressure Cooker Co., 1515 Ball Street, Eau Claire, Wis., has placed general contract with Olson & Walker, 418 Bellinger Street, for new foundry, 80 x 150 ft., to cost \$50,000 with equipment.

Clinton Pattern & Foundry Corp., Manitowoc, Wis., has been incorporated by Carl J. Clinton, Edward J. Hoffmann, Mrs. Lena Clinton and Dr. George H. Hoffmann to manufacture non-ferrous castings. Production plans have not been completed.

ABOVE AND BELOW THE HOOK



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Big loads . . . small loads . . . awkward loads and fragile loads . . . all come within the scope of Osborn Tramrail Systems.

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OSBORN

TRAMRAIL SYSTEMS

Axle Fatigue Inhibited by Truss-Graining

(Continued from Page 19)

three groups, (a) progressive fractures from bending, (b) progressive fractures from impact, and (c) progressive fractures from heat checks. Although this analysis is primarily concerned with railroad work, the conclusions also concern automobile axles. Automobile axles usually encounter stresses in (a) and (b),

whereas the high standard of ball bearings and improved lubricating systems have greatly reduced the failures resulting from progressive heat fractures, generally characterized by two or three fracture zones.

Fractures due to bending or impact are very seldom due to inferior material, but usually start as fine surface

cracks which gradually grow inward toward the center. In the case of impact, a sudden power thrust shears the material at a defective spot thereby causing a fracture. In most cases breakage does not occur until three-fourths of the axle is gone, thereby making it obvious that the strength of the material is sufficiently high. This is also borne out by the fact that axles can be occasionally subjected to stresses equal to the endurance limit without serious damage, if the amplitude is small.

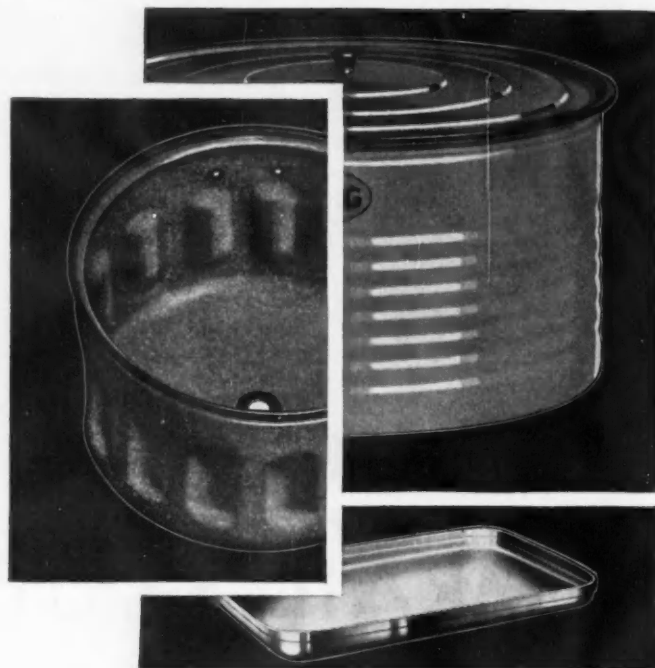
Contradicting some investigators, Dr. Künel concluded that inner defects play only a small part in the durability of the axle, whereas the prime cause of fracture was ascribed to surface defects, or to special surface stresses such as pressure or shear stresses.

Being cognizant of the fact that fatigue is a more serious enemy of axle shaft performance than any other physical property, the Spencer Mfg. Co. considered the problem as more physical or mechanical in nature rather than a problem of chemical analyses. Extensive tests showed that fatigue is prevalent in all alloy contents, as it affects high-alloy steels as well as low-carbon steels.

An automobile axle must transmit an uneven flow of power at varying speeds, and must be able to withstand road shocks, vibrations, and sudden accelerations and decelerations. In addition, it must embody sufficient hardness to withstand wear on the outer surface, and at the same time have sufficient internal ductility to resist shock stresses. Designs must be evolved to reduce localized stress to a minimum, and generous fillets must be provided in all cases so as to obliterate stress concentrations. It is apparent, therefore, that problems other than fatigue must be considered in the experiments.

Shaft Stresses Mostly Bending and Torsion

The shaft stresses include combined bending and torsion, torsion only and bending only, whereas there is little lateral tension. The repeated reverse bending stresses are, for the most part, the major cause of the fatigue growth of surface corrosion pits, scratches, etc. Usually these stresses are taken care of by providing a sufficient mass of material of known physical qualities, or by depending on metallurgists to furnish alloys which would give a designer a comfortable safety factor. So far as fatigue was considered, it was hoped that the menace would be partially overcome (Continued on Page 74)



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factors that have gained such widespread usage. And now—to this famous family—four new additions have been made. Additions that will be welcomed because they make available wires exactly adapted to specific welding problems.

- 1 ▪ E. W. for electric welding is specially processed and recommended for certain conditions where a wire having a slightly faster melting rate would be advantageous.
- 2 ▪ H. S. for gas welding is a rod specially processed for welding on steel having .20 to .40 carbon. It is free flowing, easy to handle and gives welds of high tensile strength and increased ductility.
- 3 ▪ Nickel Steel for gas welding with the amount of nickel varying according to the demand. This rod is the basis for a strong weld. Used on gear teeth, auto bumpers, etc.
- 4 ▪ U S S 18-8 Stainless and Heat Resisting Alloy Steel Welding Rods for both gas and electric welding in all commercial grades. Furnished bare in 36" lengths for gas welding and in 18" lengths, with a suitable coating for electric welding.

"U S S Chromium-Nickel Alloy Steels are produced under licenses of Chemical Foundation, Inc., New York; and of Fried. Krupp A. G., of Germany."

PREMIER TESTED WELDING WIRE

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Empire State Building, New York
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Pacific Coast Distributors: Columbia Steel Company, Russ Bldg., San Francisco

Export Distributors: United States Steel Products Company, New York

(Continued from Page 72)
by sheer metal bulk or by increasing supposedly related physical strengths.

The apparent fact is that there is no precise correlation between fatigue resistance and any one other physical property, such as tensile strength, torsion and bending strengths. As a general rule, these tests merely account for the characteristics of the grain bonding material, whereas it is believed that fatigue also occurs through the grain structure itself. This action is often mistakenly called crystallization, but the metals are originally composed of crystals, and there is no change in crystallinity due to the action of repeated stresses.

In order to discourage the growth of cracks, attention was concentrated on a possible rearrangement of the grain structure to make the material more resistant to intercrystalline slippage. This slippage is caused by a repetition of stress and reversal of stress, and not only acts in the grain bond but also in the grain structure itself. This propagation of the crack through the material is designated herein as fatigue, although theoretical considerations often are more concerned with the exact mechanism leading to the formation of the crack.

It is quite often the case that fatigue failures originate at small stress raisers at the surface, such as scale pits, foreign inclusions, tool marks, quenching cracks, etc. These imperfections are frequently imperceptible to the naked eye, but theoretical considerations indicate that the local intensity of stress at such faults may be twice or thrice that in the neighboring material. Whether the origin of fatigue cracks is always at surface irregularities, or whether they may originate at internal submicroscopic flaws, whether they always originate as the result of slip in a metal, or whether they may start without previous slip taking place, once they are started the fracture progresses until complete failure occurs.

Axles Treated in a Mechanical Manner

The Spencer Mfg. Co., therefore, treated the question as a mechanical problem instead of considering it as chemical in nature. No attempt was made to change the accepted standards of forging and heat treating. These practices are satisfactory in causing the grain flow to follow the general contour of the finished product, thereby increasing the bond strength. But the creation of fatigue resistance is not wholly related to

the creation of higher bond strength. As a result of an additional mechanical forging treatment in the Spencer plant, the grain flow in the outer sections of the shaft was so rearranged that there was much greater resistance to the start of incipient fatigue cracks. It is a truss-graining process and also serves to give better descaling, thereby resulting in deeper and more uniform hardening quench. The degree of cold straightening required is also said to be greatly reduced. The extra mechanical operation, or truss-graining process, is performed prior to the final quench. In all cases, the comparative tests on bars were made only between bars of like chemical analysis and hardness and the results of one set of experiments are shown in the accompanying table. In this case, the increase in resistance to fatigue is shown to be more than 100 per cent.

The large number of laboratory tests were performed on the specially designed machine shown in the accompanying illustration. Actual road conditions are closely duplicated, and well over 80 per cent of the stresses due to actual operation are stimulated by the machine.

The stressing machine has center loading, and is essentially of the Wöhler type. At any cross-section,

Comparative tests made on 1045 S.A.E. axles, with and without a truss-grain operation, showing the longer life resulting from the treatment. Many tests made before impartial witnesses established the fact that truss-graining usually raised the resistance to fatigue by more than 100 per cent. For all the comparisons, as shown above, standard steels were used, and the chemical analyses, hardness, testing speeds and stresses were identical for the plain and truss-grained specimens.

Identifying symbol	Regular Treatment I	Truss-Grain Treatment VV
Chemical analysis (cut from same mill bar)	1045 S.A.E.	1045 S.A.E.
Brinell hardness	373	373
Length of bar	25 in.	25 in.
Diameter of body (ground)	1.000 in.	1.000 in.
Minimum diameter of radial groove	0.800 in.	0.800 in.
Runout (unloaded)	0.0005 in.	0.001 in.
Deflection under load	0.074 in.	0.074 in.
Load applied at center of bar	715 lb.	715 lb.
Elastic limit	119,000 lb.	119,000 lb.
Ultimate strength	167,000 lb.	167,000 lb.
Stress in extreme fiber of test bar	77,000 lb.	77,000 lb.
Test stress	65 per cent	65 per cent
R.P.M. of testing machine	1180	1180
Revolutions before failure	85,350	173,700

the various fiber stresses are proportional to their distances from the axis of the specimen, the maximum fiber stress occurring at the surface of the bar. As the bar rotates, the stress in each fiber varies cyclically, according to a sine law, between equal limits of tension and compression. In this particular machine, there are no inertia stresses, and shearing stresses are very small in comparison with those of reversed bending. The machine illustrated utilizes a 2-hp. electric motor, capable of revolving a 1-in. test bar at 1180 r.p.m., when it is subjected to a dead load of 715 lb. at its midpoint. In order to localize the stresses, the bars were milled and polished with a 1/4-in. radius groove to a depth of 0.100 in. at the midpoint. The minimum diameter at this point was, therefore, 0.800 in. All the test bars, plain and truss-grained, were accurately machined and ground to the above dimensions, with a tolerance of 0.0005 in.

Attractive Finish Helps Metal Products Sales

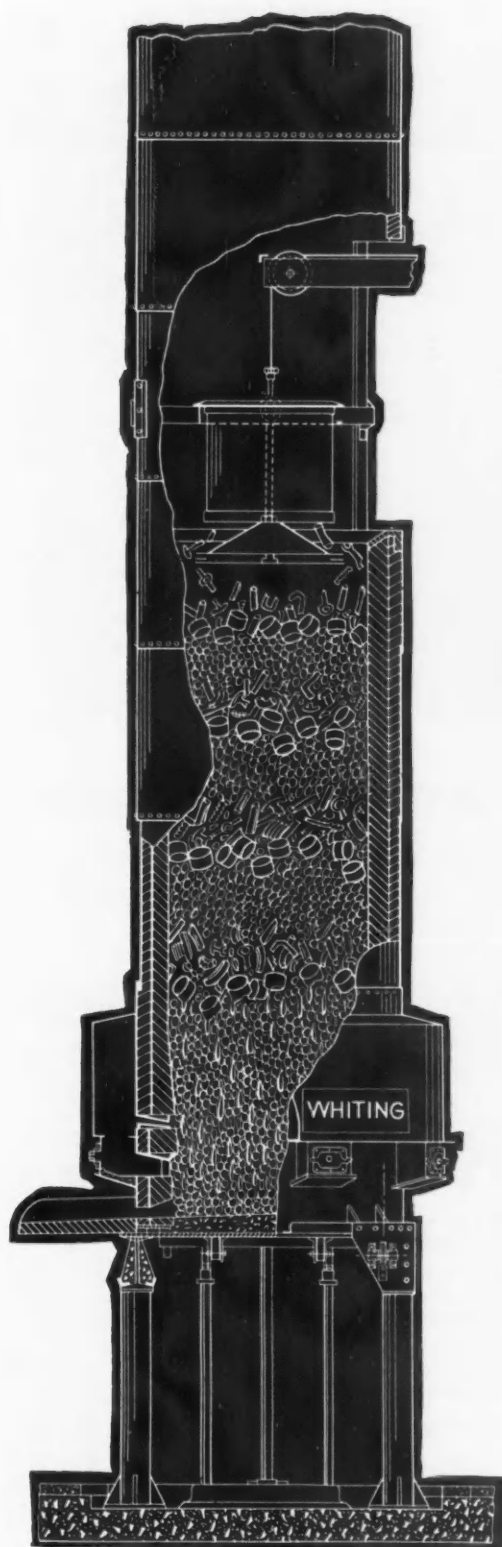
(Concluded from Page 27)

After a conference with the manufacturers the oval feature of the base was eliminated, the irons being pointed as previously, but the outline instead of being oval was a modified parabolic curve with a slight continuous increasing width from nose to heel.

Sales and style experts claimed that there was no disadvantage to this new design. In fact it seemed to have some added attractiveness, yet by making this modification it was possible to put the irons on automatic machines and cut the expense of polishing to less than half, as against previous hand methods.

The largest ferro-concrete bridge in the world is to be erected in Germany as part of a new automobile road from Munich to Salzburg. The bridge is to be 869 ft. long and 76 ft. wide, covering an area of 52,734 sq. ft. In its construction approximately 2000 tons of cement, 600 tons of reinforcing rods and 500 tons of iron sheets will be employed.

The two Mexican steel plants are operating on a 24-hr. daily schedule without the accumulation of unusual stocks. Activity in the mines, petroleum companies, construction industry and by the railroads is providing an excellent market for steel products.



PRODUCT OF A UNIT OF
UCC
UNION CARBIDE AND
CARBON CORPORATION

Electromet
Ferro-Alloys & Metals



Electromet Ferro-Alloys now available
in briquet form include E. M. SILICON
BRIQUETS (round) E. M. CHROMIUM
BRIQUETS (hexagonal) E. M. MANGA-
NESE BRIQUETS (square)

E. M. BRIQUETS put your Alloys where they do the most good

★ Every ounce of alloy added to your cupola in the form of E. M. Briquets reaches the melting zone before it is liberated. This is due to the protection of a refractory binder which does not allow the briquet to disintegrate while passing through the upper oxidizing regions. In the melting zone the binder passes off to the slag, the alloy goes into thorough solution with the iron, and a uniform product of required specifications is the result.

E. M. Briquets contain exact amounts of the alloy. When it is time to make the alloy addition the necessary number of E. M. Briquets are counted out and thrown into the cupola. The element of guess is eliminated. You know that the alloy is added in sufficient quantities and there is no waste.

Electromet engineers will be glad to help you realize every possible advantage from your use of E. M. Briquets. When requesting further information, outline your current problems and let their experience work for you.

ELECTRO METALLURGICAL SALES CORP.

Unit of Union Carbide and Carbon Corporation

UCC

CARBIDE and CARBON BUILDING 30 E. 42nd STREET, NEW YORK, N.Y.



JUST BETWEEN US TWO

No Bowl of Cherries

LIFE is real, life is earnest, we are reminded by a confrere who hints that a less frivolous tone would be more in keeping with the traditions of this family journal. So, ho for the serious! For instance:

Let the Dice Decide

WHEN we were young and in our prime as ad. student we served our time. We can hear the old prof. with the game leg, chanting, "When you sit in your handsome suite of offices and draw down \$25,000 or so a year for guiding the advertising destinies of a great corporation, you must select your mediums just as scientifically as a competent purchasing agent buys coal, or steel or chemicals. Analyze, analyze, analyze. Leave as little as possible to chance."

A single cipher stood in the way of our reaching the \$25,000 a year, but the passion for exactness instilled in us by our preceptor stayed with us. We studied how to weigh publication values down to the last pennyweight; we analyzed circulation statements so conscientiously that every last blemish and dimple were revealed.

But we found that the old prof. with the game leg had been holding back on us. He led us to believe that buyers of advertising as a whole were interested in converting their intangible art into as close an approach to an exact science as could possibly be attained.

Imagine our amazement when we found among the ranks of advertising buyers a fair sprinkling of practitioners of the "eeny-meeny-miny-moe" school of medium selectors, men who scorn such drab and hampering things as facts and who choose mediums in the carefree fashion that a wealthy, widowed ex-chorus girl selects investments.

Of course, these are the exceptions, as demonstrated by the fact that The Iron Age, which is first in plant coverage, reader preference, subscription renewal percentage, as well as in other measurable factors, is also first in advertising volume.

But that there should be any exceptions galls us no end, and unless these are soon corrected we serve notice that our faith in the ratiocinative powers of the human mind will go into a nosedive.

They Held Out on Betty

VIA Midvale's excellent little employees' magazine we learn that the hospital that removed a dime from the stomach of Betty Gale, Irvin St., Pembroke, received this note three days later from Betty's mother:

"Plese be good enouf to give betty the dime you exrayed out of her as i want her to go to the children's matinay at the picure show Saturday. Kindly oblige. Linda Gale."

Blurb of a Few Weeks Hence

WERE we to declare now that our present circulation is 1,000 above the low point of 1933 we would be stretching the truth a trifle, not beyond its elastic limit but enough to worry our New England conscience. However, aside from a major upset, nothing can keep us from claiming the four-digit gain within a few weeks.

Some Joke, Eh Mabel?

A STOMACHACHE bothered Miss Mabel Wolf, 476 Eastern Parkway, Brooklyn, so she had herself examined at the Kings County Hospital. An operation, following an X-ray, revealed that during a week's employment in a hardware store five years ago she had swallowed 1139 small items such as bolts, screws, small nails, carpet tacks, picture frame hooks, etc.

Mabel reported that she suffered some slight pain at the time. Seeking relief, she went on a fine upholstery tack diet (the doctor found 584 of this tasty item), but her health steadily declined. Too much iron, said the doctor.

Said Mabel, "I guess I did it to be funny."

A.H.D.

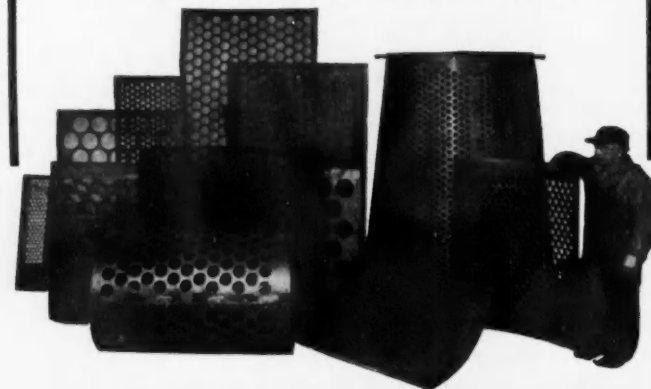
SCREENS of Perforated Metal

For a Thousand Uses

For Grain, Minerals, Chemicals or any other material to be screened

Ornamental Designs for Grilles, Cabinets, etc.

Any Metal—Any Perforation



The
Harrington & King
PERFORATING CO.

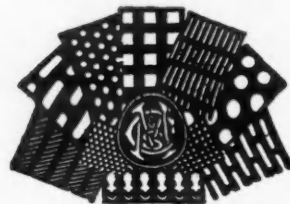
5657 Fillmore St., Chicago, Ill. 114 Liberty St., New York, N.Y.

MUNDT PERFORATED METALS

Large stocks of all metals always in hand ready to punch for any arrangement of perforations.

Sixty-one years of manufacturing perforated metals for every conceivable purpose assures satisfaction.

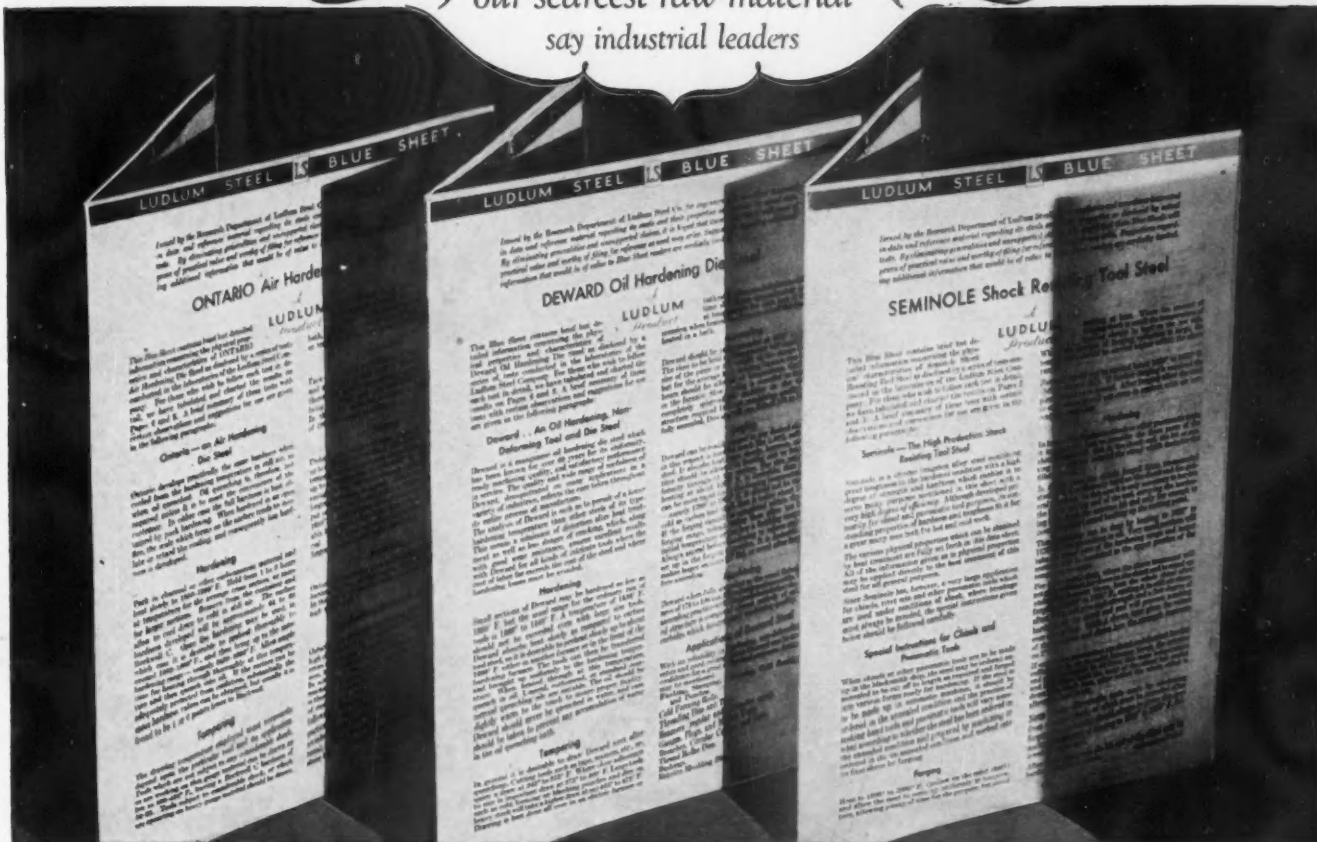
Write for Catalog of Patterns



TIN, STEEL, COPPER, ALUMINUM, BRONZE,
BRASS, ZINC, ANY METAL, ANY PURPOSE

CHARLES MUNDT & SONS
59 FAIRMOUNT AVE., JERSEY CITY, N. J.

"FACTS"
our scarcest raw material"
say industrial leaders



MORE FACTS *for* TOOL STEEL USERS

When profit or loss hangs in the balance, real facts are indispensable. Correct specification of tool or special alloy steel for each use can be made today on a basis of fact. Steel may now be purchased on the known properties of each grade, properties that, considered in relation to requirements, will make possible further reductions in unit cost, fewer replacements, longer and more satisfactory service. In this way facts contribute extra profit to the manufacturer who uses them.

As an aid to more profitable tool steel buying, Ludlum is continuing its Blue Sheet Service. These reports are prepared by the Research Department of the Ludlum Steel Company for engineers and executives interested in accurate data and reference material regarding steel and its properties, as disclosed by actual tests. We want every tool steel user to take advantage of the facts contained in Ludlum Blue Sheets. They are yours for the asking. Just mail us the coupon below.

LUDLUM

LUDLUM STEEL CO., WATERVLIET, NEW YORK

TOOL STEELS - SILCROME - NITRALLOY

LUDLUM STEEL COMPANY
Watervliet, New York



You may put my name down for the Ludlum Steel Blue Sheets. I understand this obligates me in no way.

Name.....

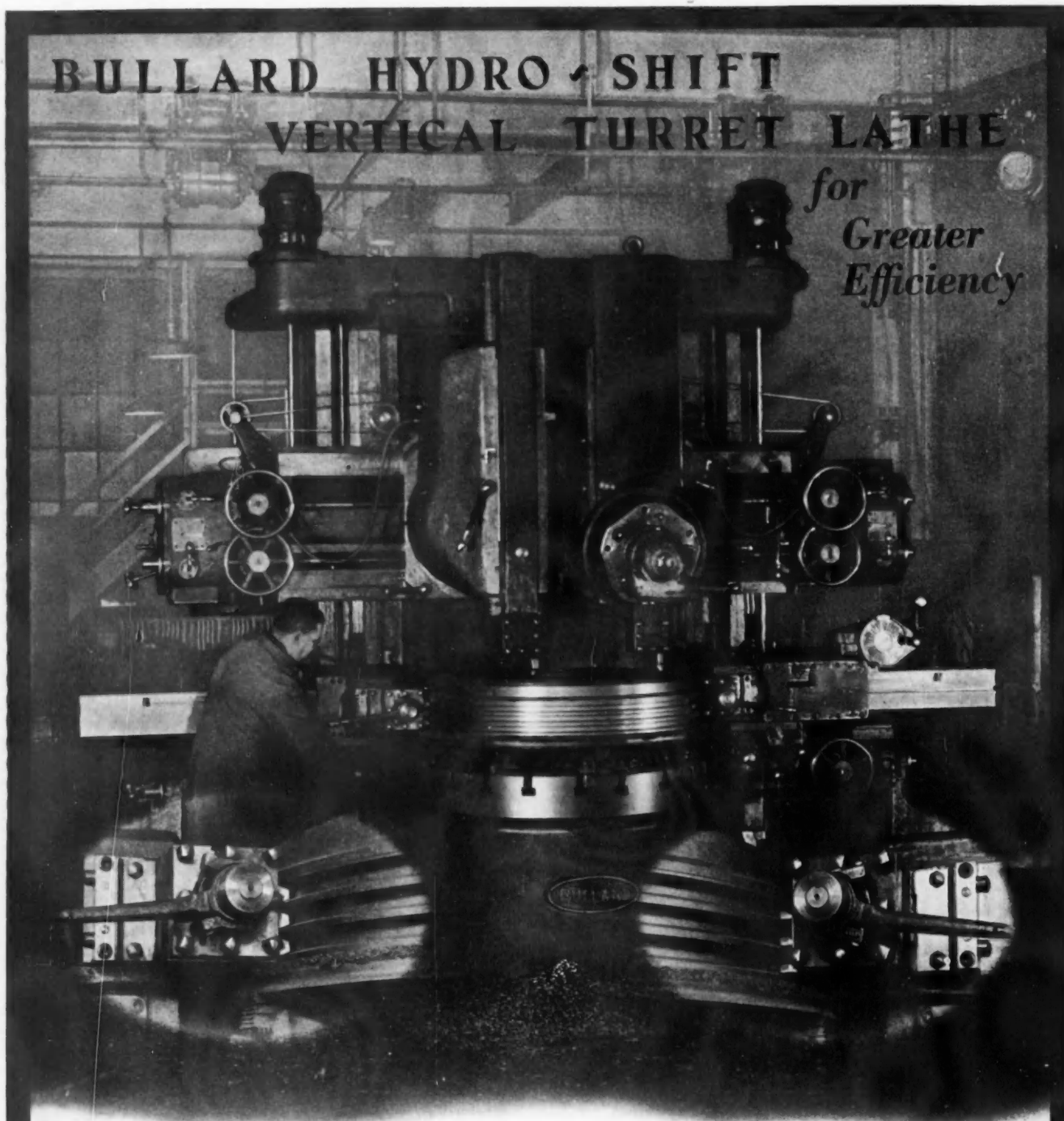
Company.....

Address.....

A3-29-34

BULLARD HYDRO-SHIFT VERTICAL TURRET LATHE

*for
Greater
Efficiency*



Two vertical heads for finish facing or other finishing operations while simultaneously two side heads are grooving provides Four Head machining Efficiency.

The work illustrated:

Cast Iron

56 inches in diameter.

Finish facing across top.

Grooving operation to $\frac{7}{8}$ -inch depth rough and finish cuts.

Time—19 minutes.

Bridgeport

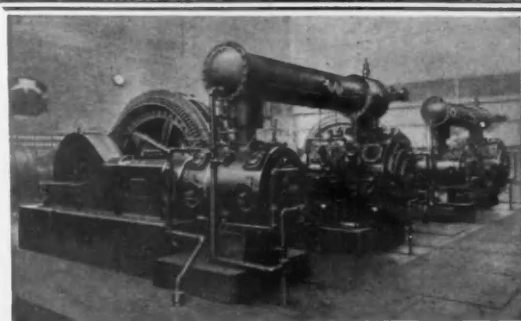
THE BULLARD COMPANY

Connecticut

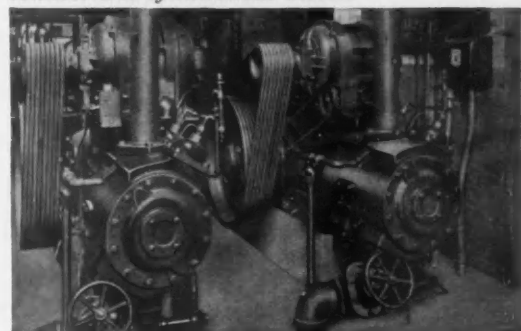
In every field and service

under the most
exacting conditions . . .

WORTHINGTON COMPRESSORS
are giving the utmost
in efficient performance



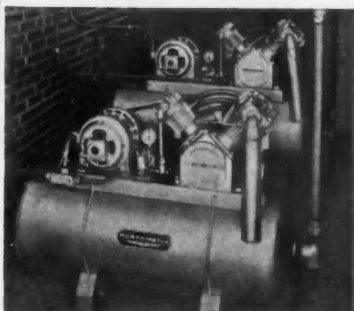
Horizontal duplex units direct-connected to synchronous motors



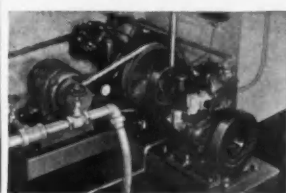
Horizontal single units with Worthington Multi-V-Drives, and motors above frames



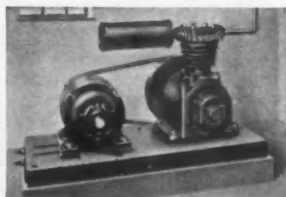
Horizontal single unit, steam driven



2-stage angle type units, tank-mounted



Angle type unit, dual drive. Motor or gasoline engine



Single vertical unit, plain base mounted

A line of compressors of a quality and completeness second to none . . . assuring the exact unit for any service condition and every type of drive . . . steam engine, Diesel or gas engine, direct-connected to motor, or belted.



WORTHINGTON PUMP AND MACHINERY CORPORATION

Works: Buffalo, N. Y. Harrison, N. J. Newark, N. J.

GENERAL OFFICES: HARRISON, NEW JERSEY

District Sales Offices and Representatives:

ATLANTA
BOSTON
BUFFALO
CHICAGO

CINCINNATI
CLEVELAND
DALLAS
DENVER
DETROIT

EL PASO
HOUSTON
KANSAS CITY
LOS ANGELES
NEW ORLEANS

NEW YORK
PHILADELPHIA
PITTSBURGH
ST. LOUIS
ST. PAUL

SAN FRANCISCO
SEATTLE
TULSA
WASHINGTON

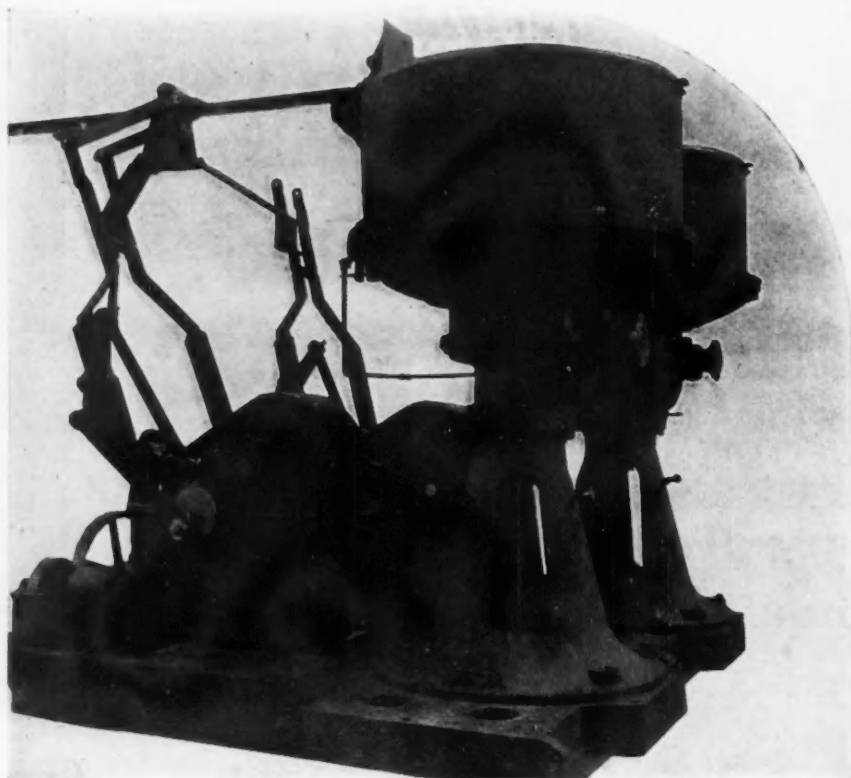
Branch Offices or Representatives in Principal Foreign Cities



WORTHINGTON



**SKF EQUIPPED
BUILT BY
MORGAN
CONSTRUCTION
COMPANY**



SPEEDY OUTPUT ALWAYS THROUGH SKF PERFORMANCE

HEAVY . . . precise . . . speedy . . . service is demanded of **SKF** thrust bearings in this Morgan Company Pouring Type reel that coils hot steel rods as they're delivered at velocities *up to 4,000 feet per minute* from the mill. Big, tough, brute jobs that **SKF** Bearings handle easily with stand-up stamina under all conditions.

And bearings must take plenty of punishment in this kind of work . . . they must keep going without trouble . . . take the gaff and come back for more . . . meet rigid requirements by giving rugged . . . smooth . . . dependable . . . performance . . . showing no wear throughout a long life . . . needing no adjustments at all. It's the *performance* in an **SKF** Bearing that counts.

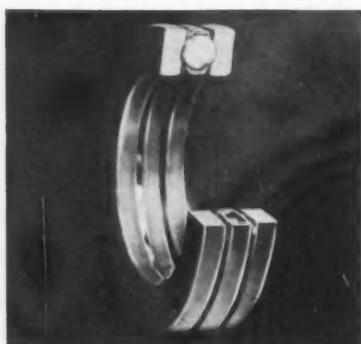
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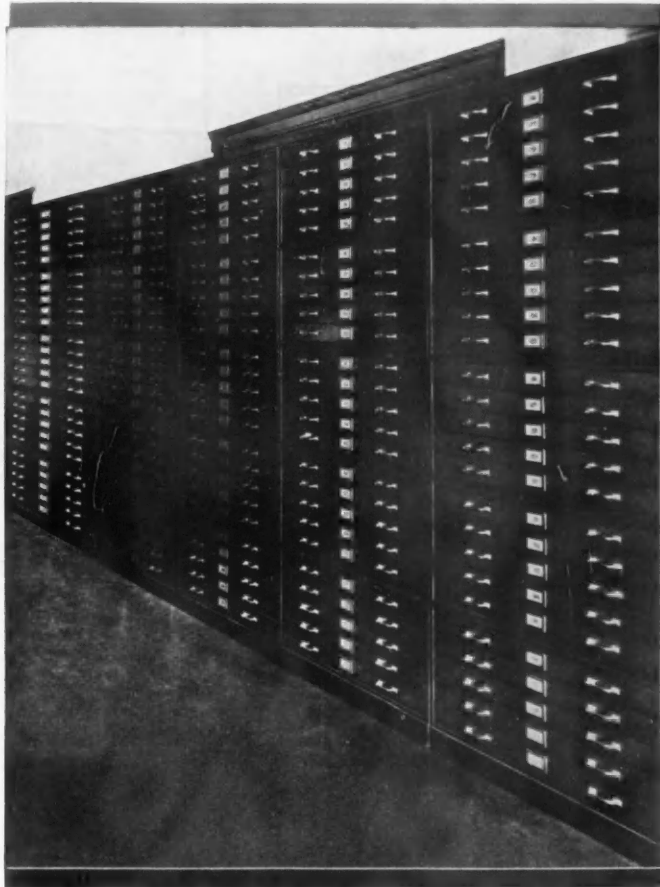
SKF INDUSTRIES, INC., FRONT ST. and ERIE AVE., PHILADELPHIA, PA.

SKF

Ball and Roller Bearings

● You may buy a bearing as a bargain but try and get a bargain out of using it, for nothing is apt to cost so much as a bearing that cost so little





● Above: Filing Cabinets made of Inland Cold Rolled Sheets.

For FINISH.
INLAND COLD
ROLLED Sheets



● Right: Inland Cold Rolled Sheets are used for unusually attractive steel card tables.

In producing sheets with unusual perfection of finish, rolling equipment is a vital factor. With the best available equipment skilled workmen can reach new heights of skill—without it they are handicapped.

The importance of equipment explains why so many manufacturers of products in which finish is important are now coming to Inland for their sheets and strip.



Inland's new sheet and strip mill incorporates the most modern developments and refinements in rolling equipment.

To release the skill of your workmen in producing beautifully finished products, use the Inland mill as your source of supply for Furniture Sheets, Auto Body Sheets, all grades of High Finished Sheets and Strip. INLAND STEEL COMPANY, 38 So. Dearborn St., Chicago, Illinois.

INLAND

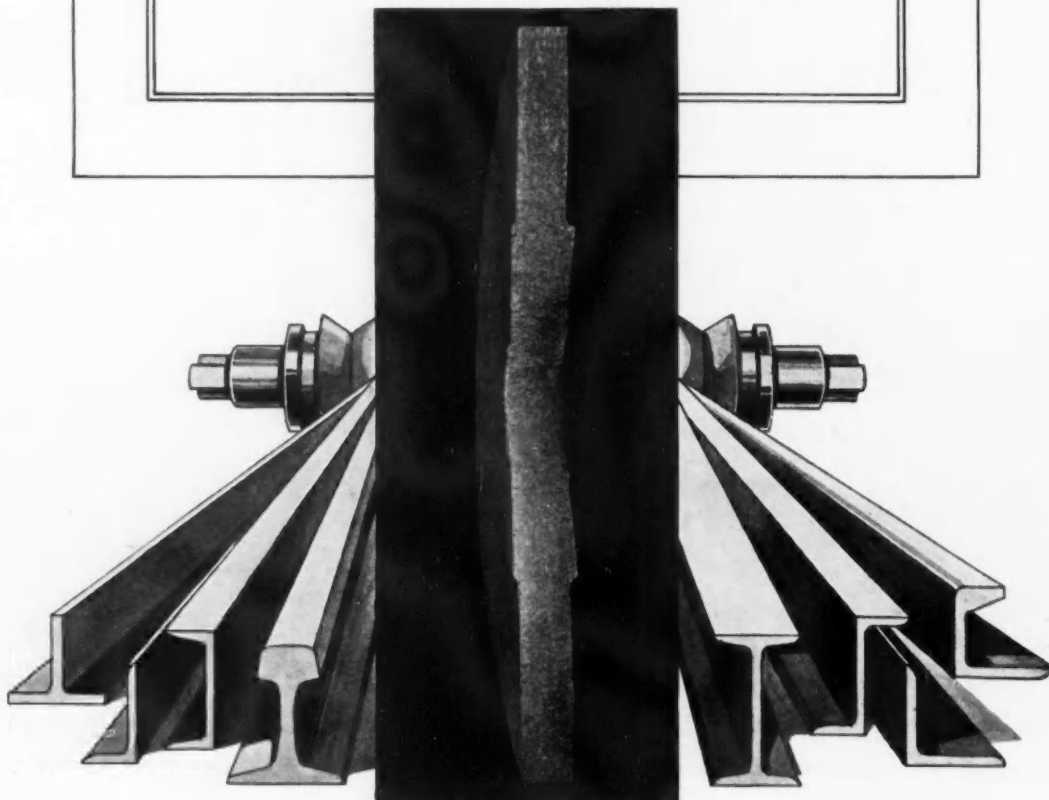
ABLE SERVANT OF THE CENTRAL WEST

STEEL

Sheets Strip Tin Plate
Plates Structural Piling

Rails Track Accessories
Bars Rivets Billets

UNIFORMITY
OF GRAIN STRUCTURE
IS ALWAYS ASSURED
IN UNEFCO ROLLS



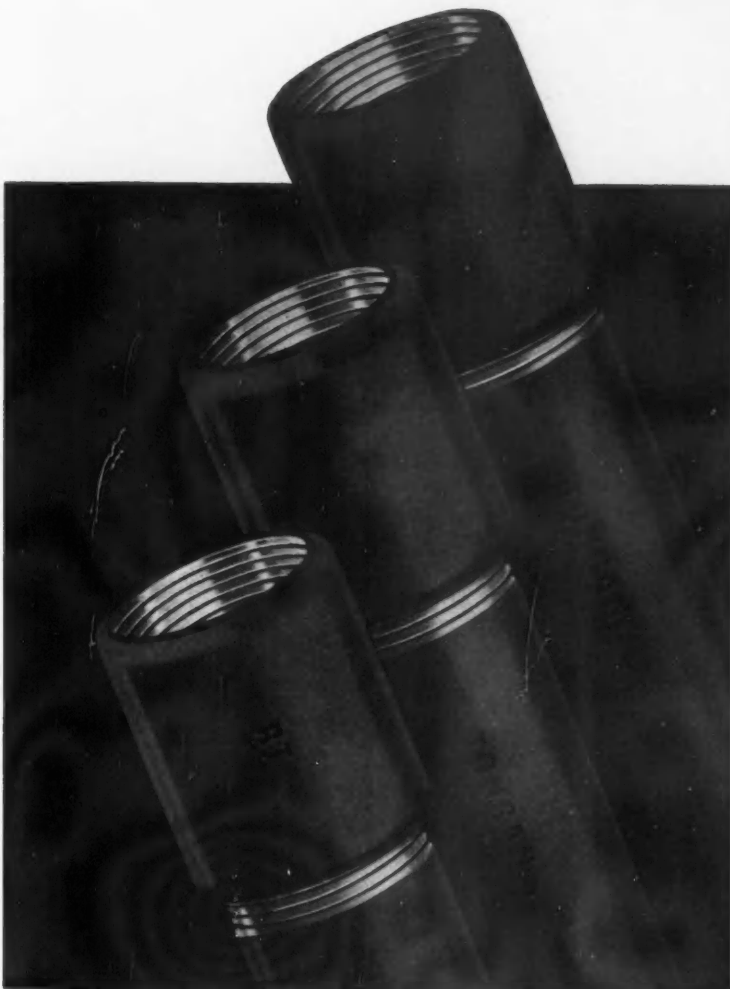
The reasons for the success of Unefco rolls are several. Because of their patented composition, an extremely close grain structure is consistently attained. Their strength will average much greater than any straight chill roll, or any other condensed-grain roll—in fact they are the strongest iron rolls of any kind available today. They are highly resistant to wear and possess long life. Used with straight faces, or with deep or shallow grooves, they have the same advantages.

UNITED
ENGINEERING *and* FOUNDRY COMPANY
PITTSBURGH — PENNSYLVANIA

THE WORLD'S LARGEST MAKER OF ROLLS AND ROLLING MILL EQUIPMENT

UNIFORMLY

FREE FROM SCALE



THE claim that Toncan Iron Pipe is free from scale is easily substantiated. All except the very small sizes are produced by Republic's patented process of electric resistance welding. This means that the pipe is made from clean, scale-free, flat strip, and at no time during the forming and welding operations is the metal subjected to a temperature that would form scale. So the resulting pipe is as free from scale as was the strip from which it was made.

In other words, Toncan Iron Pipe is free from scale, not because the pipe has been cleaned or de-scaled mechanically, but because it was made without scale.

This is an important argument in favor of this longer-lasting alloy of refined iron, copper and molybdenum, because everyone is familiar with the fact that scale accelerates corrosion and reduces pipe life.

If you would like to read the story of Toncan Iron Pipe and its proved performance in every type of service, write for a copy of the third edition of "Pipe for Permanence."

REPUBLIC STEEL CORPORATION
GENERAL OFFICES  YOUNGSTOWN, OHIO



What is the answer?

There can be but one reason why most large, modern pipe shops like Crane Company's new shop at Long Island City, N. Y., are completely equipped with LANDIS Pipe Threading and Cutting Machines and LANDIS Pipe and Nipple Threading Machines.

The answer is "Better Work at Lower Costs."

LANDIS Pipe Threading Equipment is used in pipe shops the world over—wherever quality threads are required. In a LANDIS Machine quality work does not mean slower or more expensive production—the patented LANDIS Chaser with the free cutting action of a lathe tool—insures high speed operation, accurate threads, and long tool life.

May we send you our latest literature? Write us today.

LANDIS MACHINE COMPANY, Inc.

Waynesboro, Penna., U. S. A.

Mo
all
req
Dis

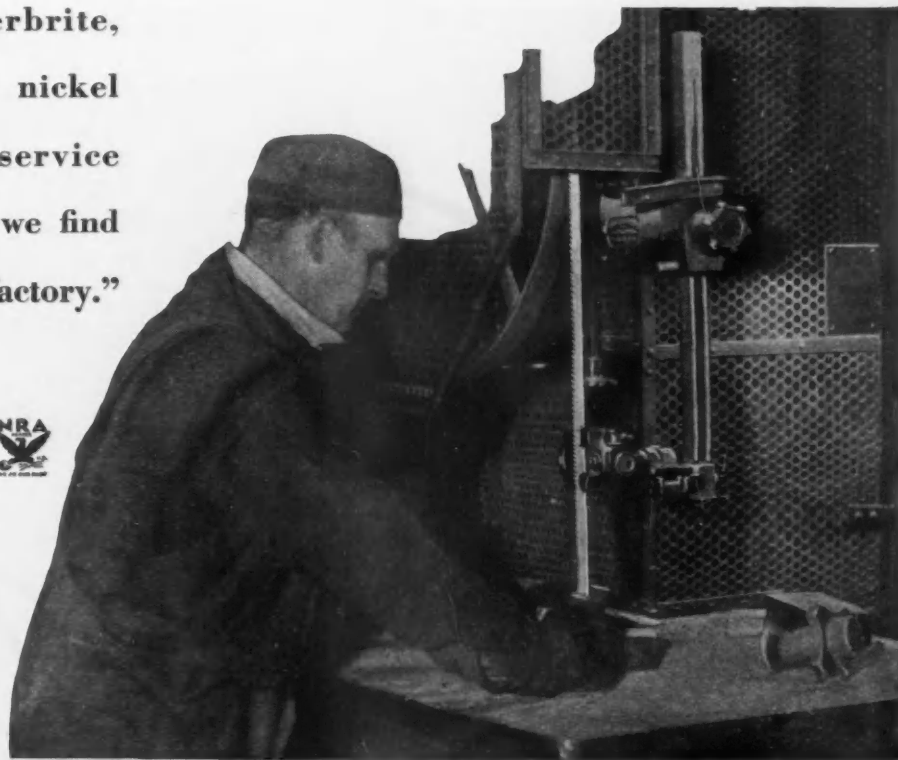
Photo
ese B
Band
opera
20 ga
castin
nickel
Willie

M
B

"... for cutting Everbrite, Monel Metal and other nickel alloys on which the service required is most severe, we find Disston Bands very satisfactory."



Photograph taken at plant of American Manganese Bronze Company, Philadelphia. Thompson Band Saw Machine, 29 1/2" diameter, 28 R. P. M., operating Disston Band, 15' 7" long, 5/8" wide, 20 gauge, 10 teeth per inch. Cutting risers from castings of Everbrite, Monel Metal and other nickel alloys. Statement on results, by C. H. Williams, Manager, quoted above.



DISSTON

METAL-CUTTING BAND SAWS meet every need for shape and size of teeth, set, speed, feed—**Plus UNIFORMITY** in steel and heat-treatment, assuring hardness **ALIKE** in every tooth and satisfactory service under most severe requirements. Disston Bands make men and machines more productive, reducing costs.

HACK SAW BLADES . . . Made of full high-speed steel from Disston's own steel furnaces. Stay sharp longer. Cut faster. More work per hour; more hours per blade.

METAL-SLITTING SAWS . . . Hollow-ground for clearance. Not only accurate and efficient for slotting, but economical for regular cut-off work on small stock.

HIGH-SPEED STEEL TOOL-HOLDER BITS . . . Designed for heavy cuts at high speed. Hardened and tempered. Dressed at both ends. Individually inspected.

DISSTON FILES . . . Sharp, deep teeth, cut uniform in width and at correct angles, on a foundation of Disston file steel. Cut faster. Last longer. Unequalled in economy.

Henry Disston & Sons, Inc.

3519 TACONY, PHILADELPHIA, U. S. A.

Canadian Factory: TORONTO

Branches:

BANGOR, ME., BOSTON, CHICAGO, DETROIT, MEMPHIS, NEW ORLEANS, SEATTLE, PORTLAND, ORE., SAN FRANCISCO, VANCOUVER, B. C.



FREE to you . . .
Any one or all of these
DISSTON METAL-CUTTING MANUALS



To:
HENRY DISSTON & SONS, Inc.
3519 Tacony,
Philadelphia, U. S. A.

Checked below are the Metal-Cutting Manuals which you will please send, marked for the attention of undersigned.

- | | |
|----------------------------------------------------------|--------------------------------------------------------|
| <input type="checkbox"/> Disston Metal-Cutting Band Saws | <input type="checkbox"/> HACK SAW BLADES |
| <input type="checkbox"/> DISSTON FILES | <input type="checkbox"/> Carbide-Fitted Saws and Tools |
| <input type="checkbox"/> Solid-Tooth Metal-Cutting Saws | |

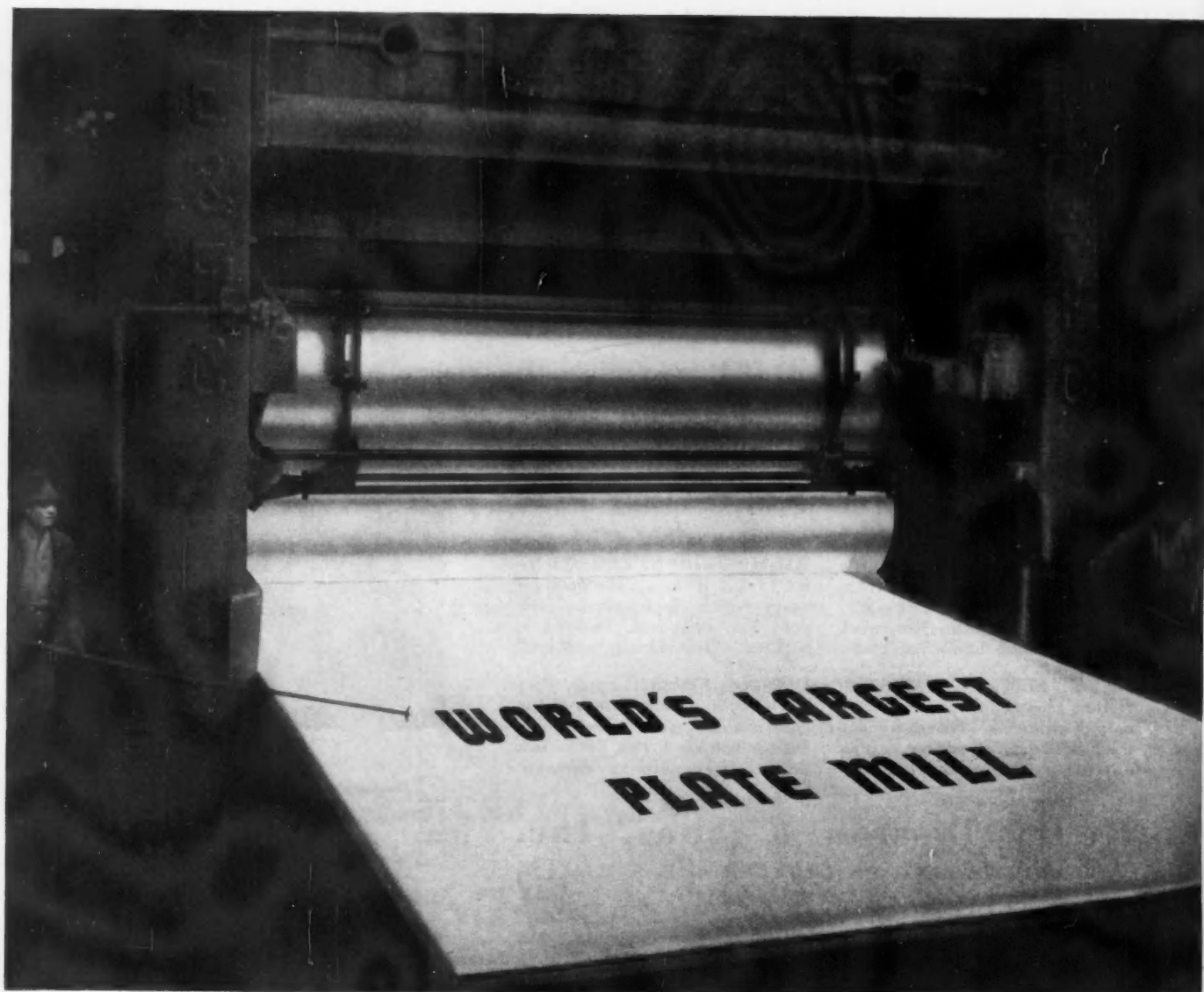
Attention of:

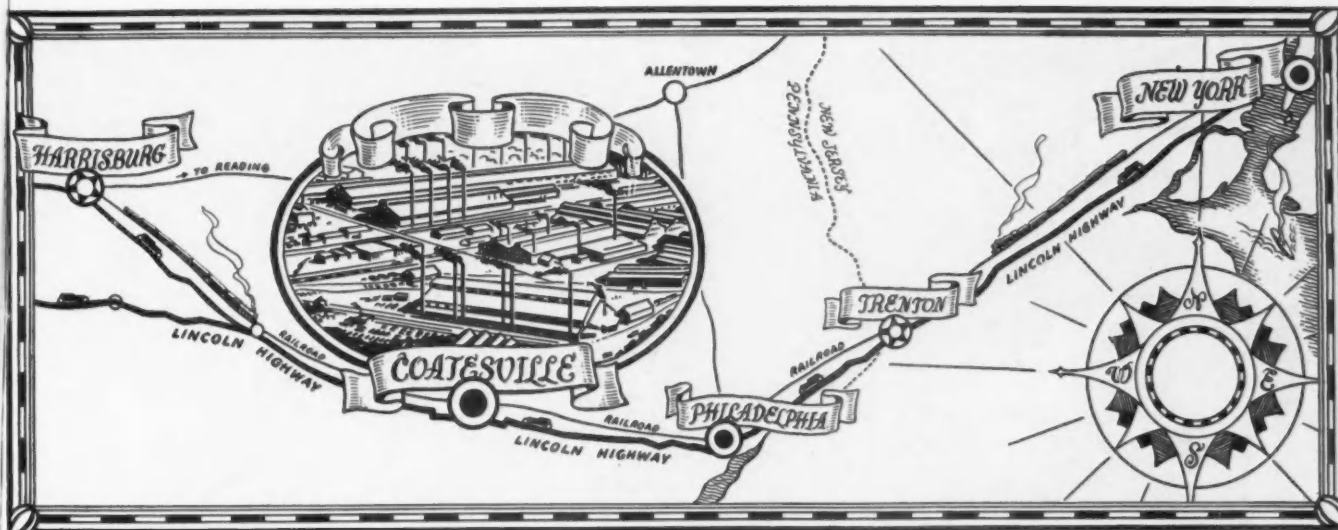
Firm Name:

Address:

Coatesville is only an hour's ride west from Philadelphia, an hour and a half east from Harrisburg, on the main line of the Pennsylvania Railroad. If you're driving on the Lincoln Highway, Coatesville is right on your route. STOP AND SEE US!

Come





see us some time!

Don't expect to see "just another" steel plant or rolling mill here in Coatesville. If you have never seen the World's Largest Plate Mill in operation, a new thrill is waiting for you.

Here is a "Big Mill" the like of which you can see nowhere else in this wide world. It is 47' high, has two working rolls nearly 3' in diameter, over 17' wide, which weigh 60 tons; two supporting rolls over 4' in diameter, weighing 120 tons.

You can see the "Big Mill" take a 40' ingot—45 tons of hot metal—and with pass after pass, reduce it to a sound, dense base plate, weighing nearly 50,000 pounds, 25" thick and 84" square. Or you can see the rolling of a boiler plate of the quality for which Lukens has long been known, $\frac{3}{8}$ " thick, 186" wide and 250" long. Or it may be a Nickel-Clad Steel Plate, rolled from

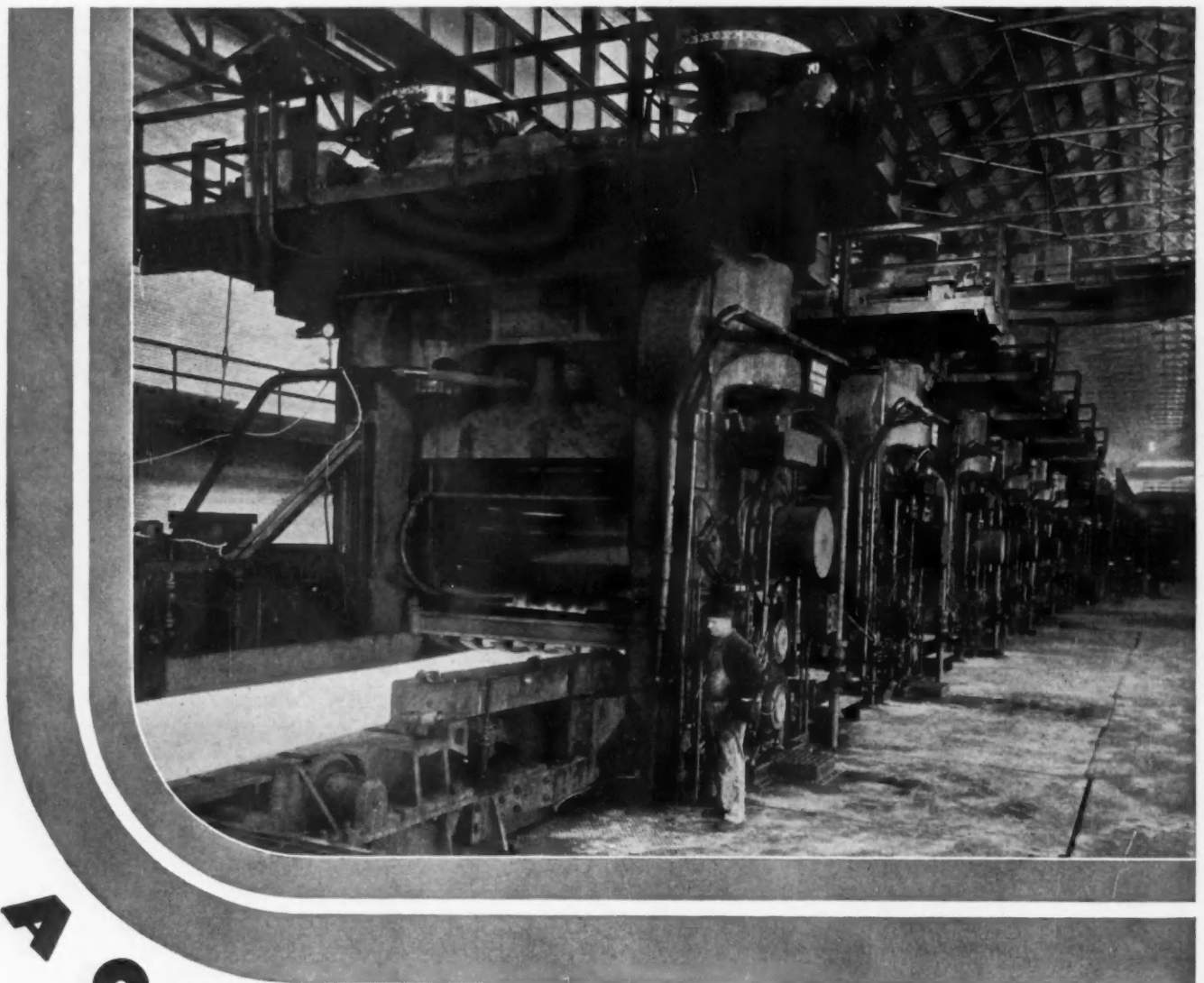
layers of pure, solid Nickel and steel, for use in corrosion-resisting equipment.

You can see the flame-cutting of intricate shapes from steel plate 20" or more in thickness, or the spinning of a hot circle of steel into a flanged head 16' in diameter. In the plant of Lukenweld, Inc., a division of Lukens, you can see the welding of steel plate into mammoth press frames, Diesel engine crankcases, or a one-piece engine bed for a high-speed streamlined train.

Pages of space would be needed to do more than hint of the interesting and unusual things you can see that will make you say, as have hundreds of visitors before you, "The trip was certainly worth while!" When can we expect you? Write, 'phone or wire us. We assure you of a cordial welcome, and an interesting visit. Come . . . see us some time!

LUKENS STEEL COMPANY

FIRST TO ROLL BOILER PLATE IN AMERICA
COATESVILLE, PENNSYLVANIA



A CONTINUOUS MILL 2100 FEET LONG

● Illinois Steel Company's new 96" Continuous Plate Mill represents the last word in the control of rolling operations to assure a high degree of accuracy in size and finish.

The mill is more than a third of a mile long—from soaking pits to the last of the

nine stands of rolls. Yet so precise is the control that rolling speeds of 700 feet per minute can be attained.

The mill has a capacity for plates up to a width of 84 inches, a length of 140 feet, and in thicknesses from one-eighth inch up.

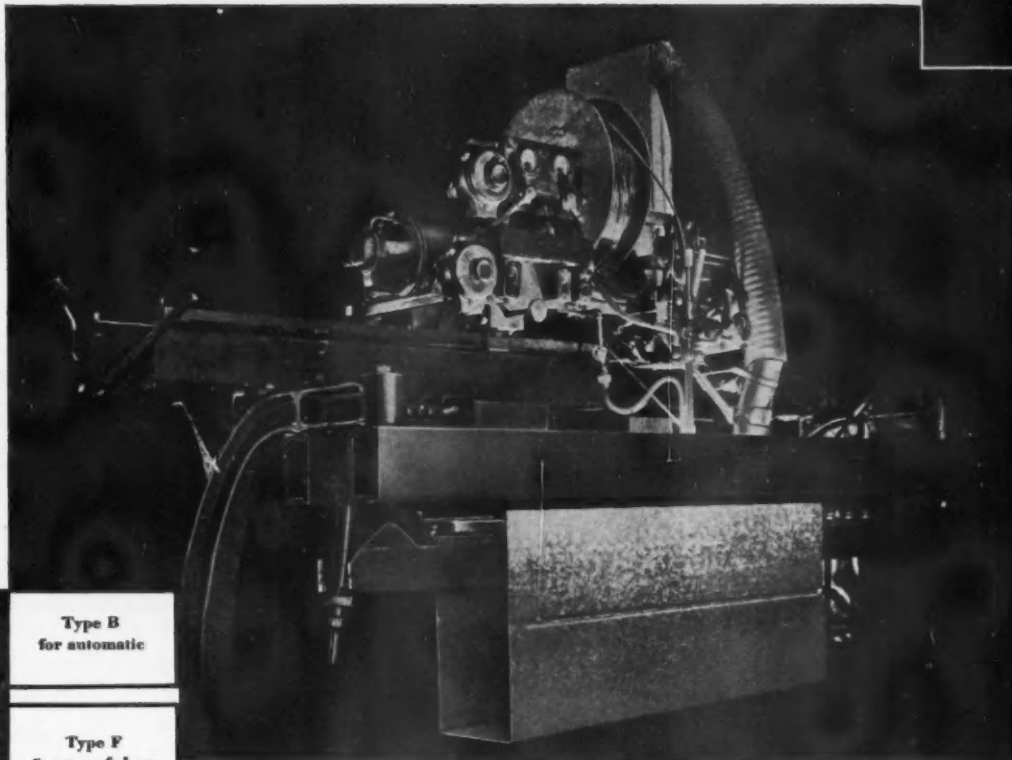
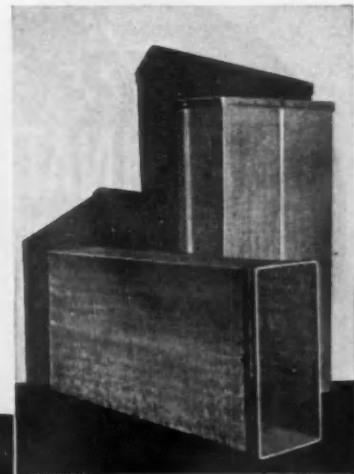
Illinois Steel Company

SUBSIDIARY OF UNITED STATES STEEL CORPORATION
208 South La Salle Street, Chicago, Illinois



ILLINOIS PLATES

THIS COMPANY ARC WELDS ITS ENTIRE OUTPUT WITH G-E ELECTRODES



G-E WELDING ELECTRODES

Type B
for automatic

Type F
for run-of-shop

Type H
for automatic

Type W-20
for vertical and
overhead

Type W-84
for nickel-manga-
nese deposits

Type W-85
for nickel-manga-
nese deposits

Type W-90
for battered rail
ends



AFTER thorough investigation, the Knickerbocker Stamping Co., Parkersburg, W. Va., decided to use automatic arc welding in manufacturing its galvanized-steel ice cans, and selected G-E Types B and H welding electrodes for the job. Since adopting arc welding, its entire output—over 170,000 units—has been fabricated by this modern production tool. The satisfactory service these ice cans are giving, and their strong, simple construction and unusually smooth appearance more than justify the continued use of G-E welding electrodes by this company.

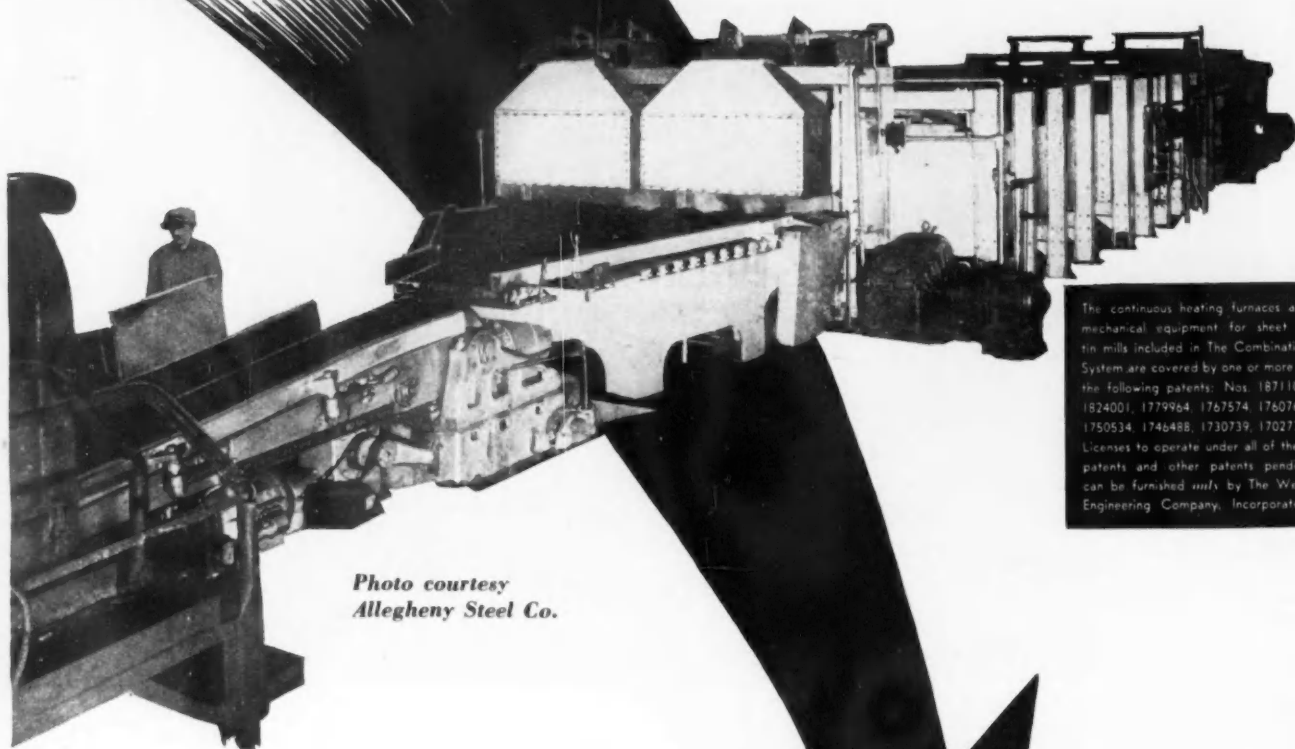
G-E welding electrodes and automatic arc-welding equipment are designed for high-speed mass-production welding. With them, you will obtain strong, leak-proof welds of uniformly high quality and good finished appearance, at low production cost.

You can order from General Electric everything you need for arc welding—electrodes, welders, cables, accessories—on one order blank. Write for a copy of booklet GEA-1546A, which describes G-E electrodes and recommends the type to use for each job. Address your request to the nearest G-E welding distributor, or to General Electric, Dept. 6A-201, Schenectady, N. Y.

150-24

GENERAL  ELECTRIC

The
**"COMBINATION
 SYSTEM"** *for*
TRADE MARK
 SHEET AND TIN PLATE
 PRODUCERS



*Photo courtesy
 Allegheny Steel Co.*

The continuous heating furnaces and mechanical equipment for sheet or tin mills included in The Combination System are covered by one or more of the following patents: Nos. 1871102, 1824001, 1779964, 1767574, 1760762, 1750534, 1746488, 1730739, 1702739. Licenses to operate under all of these patents and other patents pending can be furnished only by The Wean Engineering Company, Incorporated.

Labor must be aided by efficient equipment if it is to produce sheet steel or tin plate at a price that will promote sales in sufficient volume.

The "Combination System" aids labor to turn out greater production with less physical strain. The operating cost of the "Combination System" involving the use of Continuous Furnaces and Automatic Feeding and Catching Tables is competitive with any other flat rolling method.

WHY?

*Because It's
 Labor-Aiding!*

THE WEAN ENGINEERING CO., Inc. • • • Warren, Ohio

FLINN & DREFFEIN CO. • Associated Companies • THE MCKAY MACHINE CO.

IT IS ONLY WIRE...



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There are few other products where various specimens can seem so alike yet be so different. Even wires made in strict conformity to the same specifications will often show such different characteristics that it is hard to believe they are chemically the same and that the same specifications have been followed. Wickwire Spencer engineers have developed a technique beyond specifications because of the closeness with which they work with their users. Yes, specifications are religiously followed, but a shade here

and there in treating, a better control of non-metallic inclusions, and a host of other finer points in wire making give Wickwire Spencer users wire with that certain something that makes it best for a particular job.

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41 East 42nd Street, New York City; Buffalo, Chicago, Detroit, Philadelphia, Tulsa, Worcester; Pacific Coast Headquarters: San Francisco; Warehouses: Los Angeles, Seattle, Portland. Export Sales Department: New York City.

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by Wickwire Spencer



Wickwire Spencer manufactures High and Low Carbon Wires—in various tempers, grades and finishes—for your specific purpose. Hard-Drawn, soft or annealed Basic or Bessemer Wires—Hard-Drawn annealed, or oil-tempered Spring Wire, Chrome Vanadium Spring Wire—Valve Spring—Music—Clip—Pin—Hairpin—Hook and Eye—Broom—Stapling—Bookbinding—

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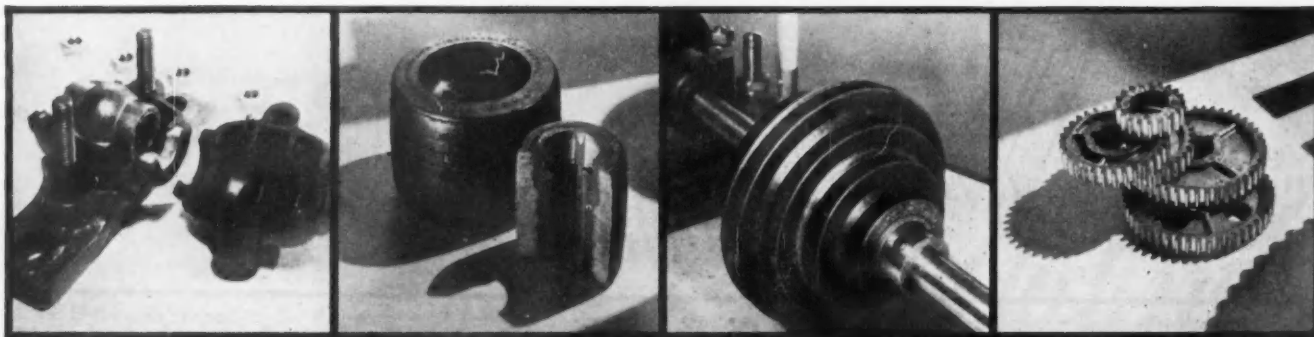


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You can't use zinc gears to lift a locomotive. But you can use zinc alloy die castings in a wide number of strictly mechanical applications. Here are typical bearing, pulley, clutch and gear groupings. A thorough knowledge of the limitations of zinc alloy die castings will pleasantly surprise you.

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Important savings can be made by using Jones & Laughlin Wide Cold Rolled Flats to replace forgings, expensive castings or hot rolled plates which would require planing to size. They are suited to a wide variety of applications, such as: stripper plates, backing plates for dies, die plates, punch pads, jigs and fixtures, plate or die molds, pattern plates and machinery parts. J&L Wide Cold Rolled Flats are true to size and section, bright and smooth in finish. Widths up to 12", thicknesses up to 2½".

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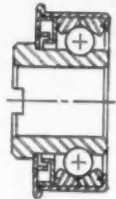
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Canadian Representatives: JONES & LAUGHLIN STEEL PRODUCTS COMPANY, Pittsburgh, Pa., U. S. A., and Toronto, Ont., Canada

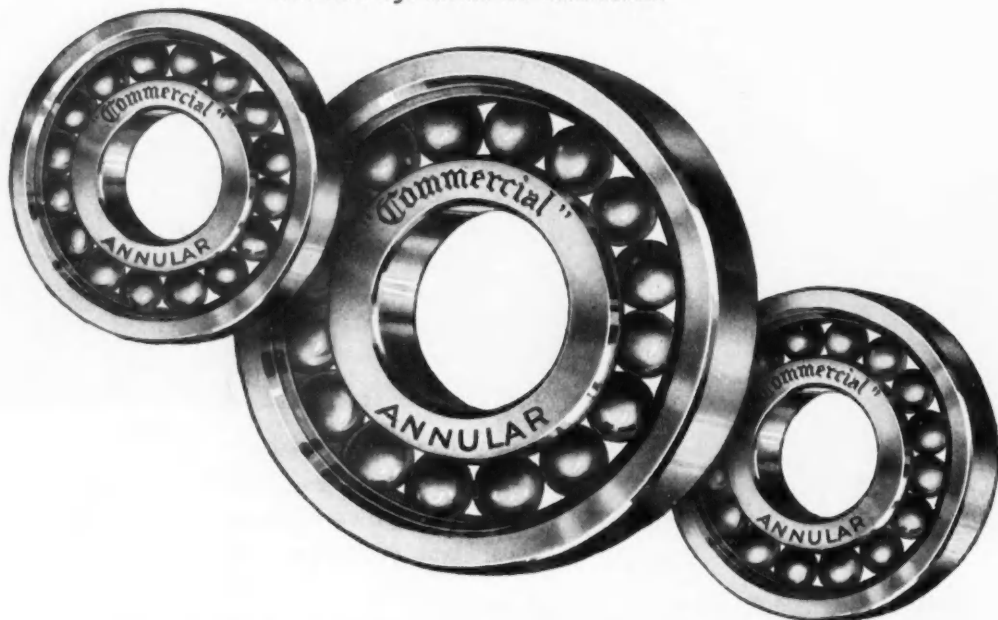
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Hundreds of manufacturers in various industries use "Commercial" Annular Ball Bearings for the reason that they are moderately priced. Others select these bearings because of efficient performance.

Lower bearing costs plus better service offer a combination much to be desired. Whether you are interested in "price" or in efficiency, or both—"Commercial" Annular Ball Bearings should be considered.

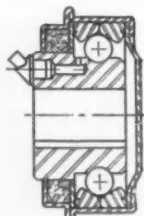


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"Commercial" Annular Ball Bearings are obtainable in standard sizes, or made to meet your requirements. They easily withstand an overload and have dual thrust capacity. Speeds up to 2500 R.P.M.

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"The Linde organization was called in to help install a new welding department and assist in organizing welding operations. Linde engineers worked day and night supervising the training of 125 new welders. In two weeks' time the new welders were doubling production! Thousands of dollars in orders were saved!"

This manufacturer's experience is but one of many instances of how Linde Process Service continuously translates proved methods into terms of actual plant requirements and saves money for Linde users. It indicates why countless manufacturers buy everything for oxwelding and cutting from Linde.

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Users of products and processes developed by Units of Union Carbide and Carbon Corporation benefit from a most unique coordination of scientific research with manufacturing, sales, and service facilities. You are cordially invited to visit this summer the numerous exhibits sponsored by the Corporation in both the Basic and Applied Science sections in the Hall of Science at Chicago's 1934 A Century of Progress Exposition.



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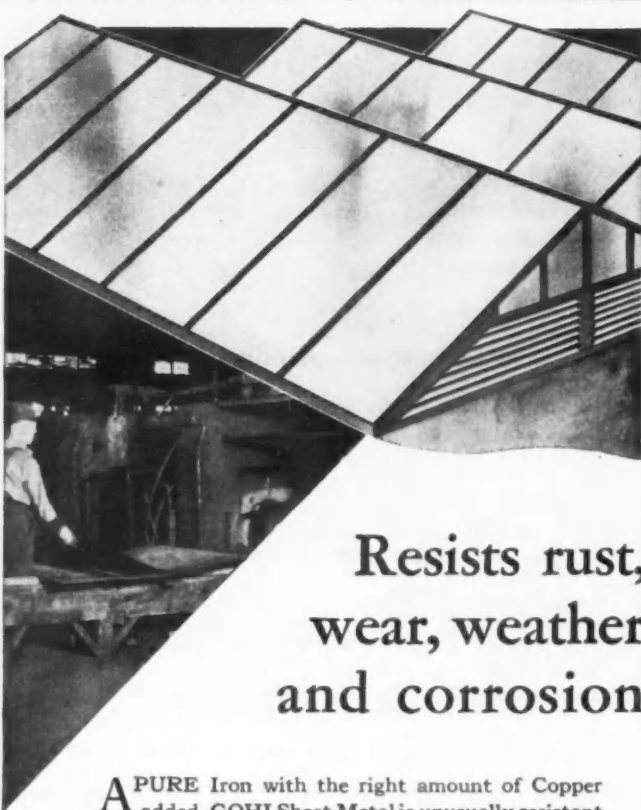
Unit of Union Carbide and Carbon Corporation

126 Producing Plants **UCC** 627 Warehouse Stocks
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and corrosion

A PURE Iron with the right amount of Copper added, GOHI Sheet Metal is unusually resistant to wear, weather, rust, and corrosion. This is conclusively proved by the fact that it has been used extensively as roofing for nearly twenty-five years.

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Made from carefully controlled alloys to customers' specifications.

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Auxiliary equipment, including fuel and lubricating oil filters, oil reclaimers and exhaust mufflers

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Unit type for complete year 'round air conditioning service

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Machines Produce More with Good Cutters



If a machine shuts down a half hour each day you find out why, but—do you ever question how many needless delays are caused by cutter replacements? Every time a cutter is changed, machine and operator stop producing and production is at a standstill. In an involved set-up the expense can be tremendous, yet—the difference in price between the poorest and best cutters is relatively small.

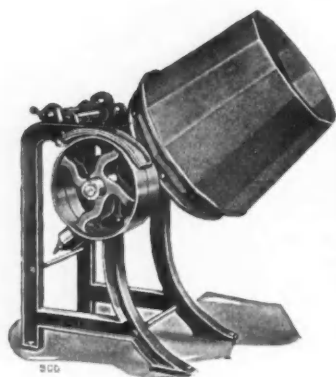
Brown & Sharpe Cutters permit steady, fast production—with minimum replacement for sharpening—machines produce more with them. Use Brown & Sharpe Cutters on every job. Catalog No. 31C sent on request. Brown & Sharpe Mfg. Co., Providence, R. I., U. S. A.

*Economical Cutters
are selected
the "Real Cost" Way*



Brown & Sharpe Cutters

MODERN—EFFICIENT—KEEP COSTS LOW



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When production costs **must** be lowered and when savings **must** be affected somehow—you probably need new machines. You might be tempted to try your hand at building a machine to serve your own needs, but don't do it because Baird can sell you the machine for less than you could build it.

Shop around to satisfy yourself, if you like, but ask Baird first because we know our

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Whether it is a tumbling barrel for any type of wet or dry tumbling that you need, or accurate automatic lathes, automatic multiple spindle internal grinders, automatic punch presses, wire forming machines, etc.—Baird can help you make the savings.

"Ask BAIRD About It."

THE BAIRD MACHINE CO., Bridgeport, Conn.



CUT METAL CLEANING COSTS

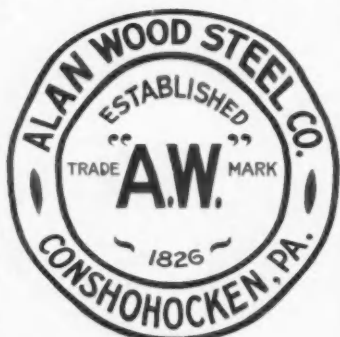
There are several ways in which the use of "balanced alkalies" will reduce your cleaning costs.

- 1. Quicker Action.**
- 2. Sustained Cleaning Strength.**
- 3. Dependability.**
- 4. Fewer Rejects.**

The principle of "balanced alkalies" is the fundamental reason for the super-efficient cleaning action of Wyandotte Metal Cleaners. This principle is exclusive with Wyandotte. A test will quickly prove that you can cut your metal cleaning costs with Wyandotte. Write for detailed information.

THE J. B. FORD COMPANY + + + Wyandotte, Michigan

Wyandotte
Clean "Chemically Clean"
Metal Cleaners



*108 Years Iron and
Steel Making Experience*

CARBON *and* ALLOY STEELS

BLUE ANNEALED SHEETS
SHEARED PLATES — BILLETS

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During 37 years of manufacturing sheet metal stampings exclusively, performance has been our organization key-note. Our customers, in many lines of business—airplane, automotive, dairy, lawn mower, refrigerating, railway, ventilating, etc.—will attest to this.

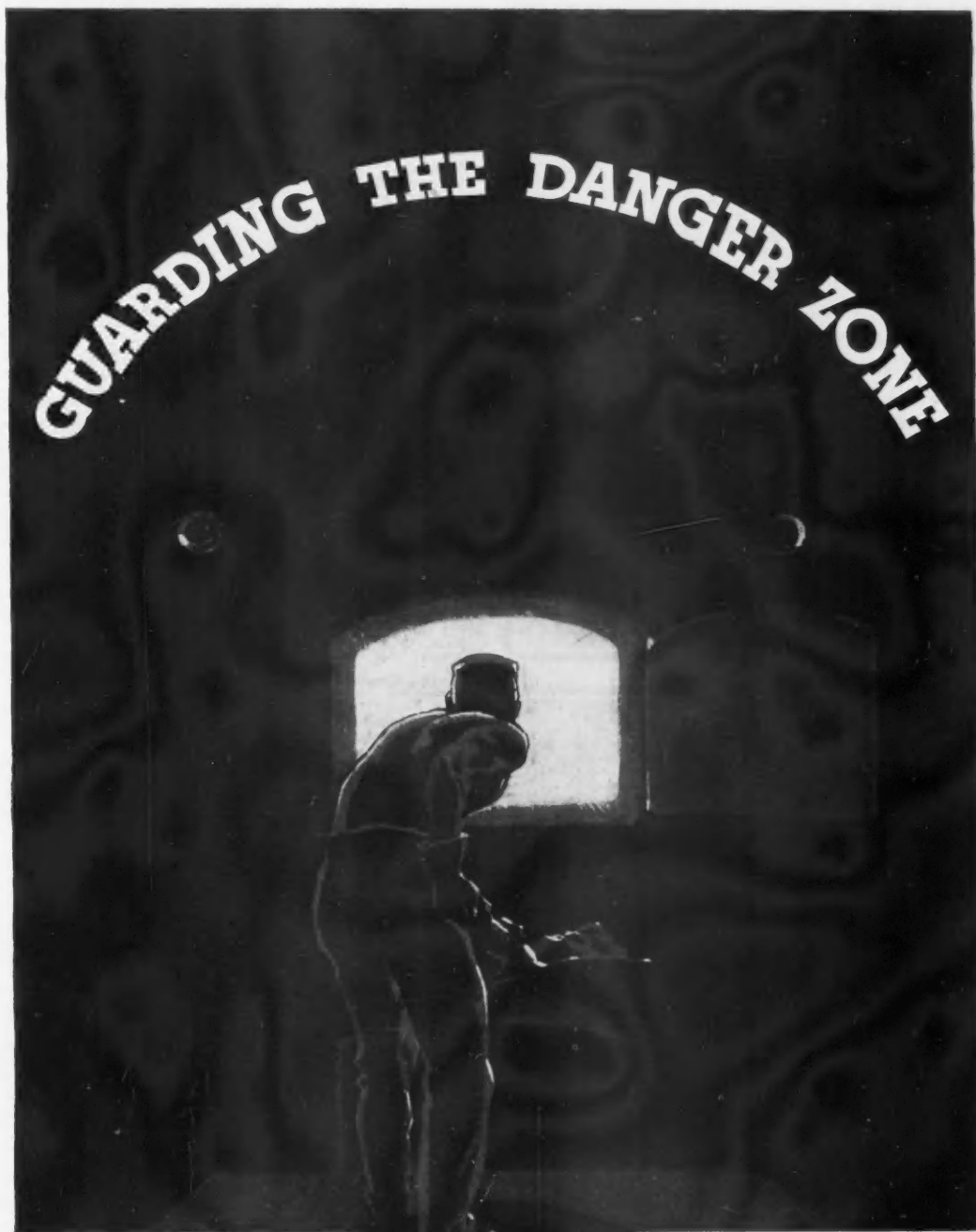
Open hearth, cold and hot rolled, high carbon, and stainless steels, duralumin, aluminum, brass, copper, and zinc are some of the metals we form and draw.

Manufacturers of "IDEAL" TROLLEY WHEELS

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**Cutting Off
Machines for
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—for thin and thick wall steel tubing and bars

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SCHATZ MFG. CO., The, Poughkeepsie, N. Y.

TIMKEN ROLLER BEARING CO., Canton, O.

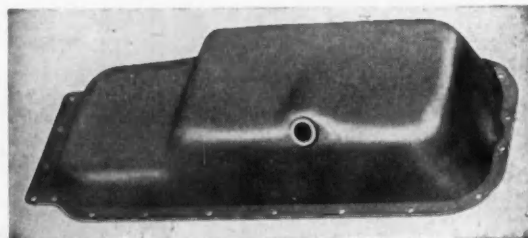
After the first stamping job . . .

They come back for more!

Many of our present customers first came to us when they wanted an unusual stamping that called for real experience and ingenuity in the making of it.

Here at Parish they found men accustomed to tackling unusual jobs. These men had at their command a laboratory; a well equipped press department; heat treating equipment. They knew the characteristics of alloy steels intimately, and how to make the dies to work them successfully. They were experienced in design, and in the practical aspects of stamping production.

The experience and ingenuity of these men resulted in the successful production of the unusual stamping at a reasonable price. That's why Parish customers continue to come back for more.



PARISH PRESSED STEEL CO.

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PACIFIC COAST REPRESENTATIVE

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BEARINGS—Thrust
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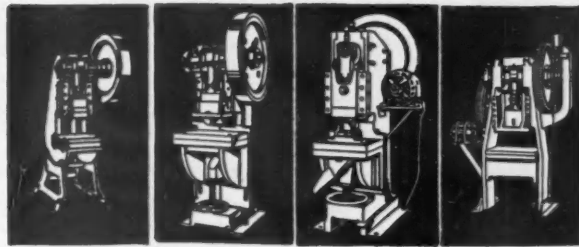
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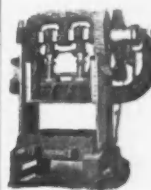


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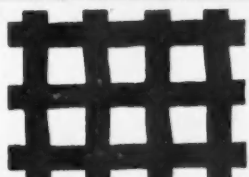
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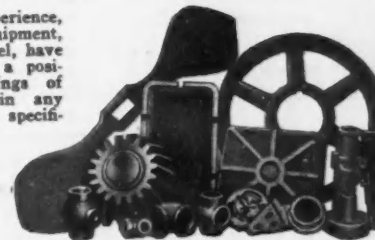
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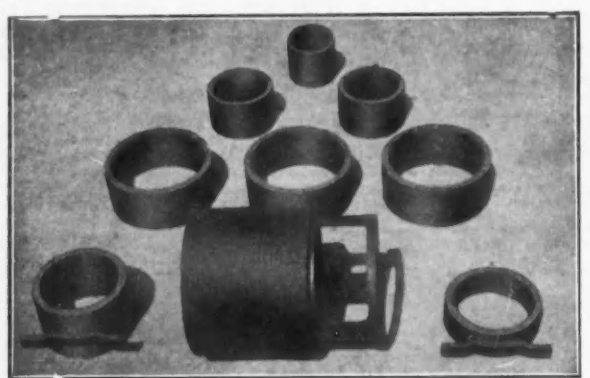
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**HACK SAW BLADES—See Saws—Hack
Saw Blades**
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Parish Pressed Steel Co., Reading, Pa.
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Detroit (Mich.) Hoist & Mch. Co.
Bidgway, Craig & Son Co., Coatesville, Pa.
HOISTS—Chain
Osborn Mfg. Co., Cleveland.
Wright Mfg. Co., York, Pa.
HOISTS—Electric
American Engineering Co., Philadelphia.
Detroit (Mich.) Hoist & Mch. Co.
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Osborn Mfg. Co., Cleveland.
Philadelphia (Pa.) Gear Works.
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Shepard Niles Crane & Hoist Corp., Mont-
tour Falls, N. Y.
Wright Mfg. Co., York, Pa.
HOISTS—Electric Traveling
Cleveland Electric Tramrail, Wickliffe, O.
Osborn Mfg. Co., Cleveland.
Shaw-Box Crane & Hoist Co., Inc., 402 Broadway, Muskegon, Mich.
HOISTS—Monorail
Osborn Mfg. Co., Cleveland.
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Goodrich, B. F., Rubber Co., Akron, Ohio.
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Ct.

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National Mchry. Co., Tiffin, Ohio.

NUTS—Acorn

Republic Steel Corp., Upson Nut Div.,
Cleveland, O.

Russell, Burdall & Ward Bolt & Nut
Co., Port Chester, N. Y.

NUTS—Castellated

Republic Steel Corp., Upson Nut Div.,
Cleveland, O.

Russell, Burdall & Ward Bolt & Nut
Co., Port Chester, N. Y.

NUTS—Cold Punched

Republic Steel Corp., Upson Nut Div.,
Cleveland, O.

Russell, Burdall & Ward Bolt & Nut
Co., Port Chester, N. Y.

NUTS—Hot Pressed

Republic Steel Corp., Upson Nut Div.,
Cleveland, O.

Russell, Burdall & Ward Bolt & Nut
Co., Port Chester, N. Y.

NUTS—Semi-Finished

Republic Steel Corp., Upson Nut Div.,
Cleveland, O.

Russell, Burdall & Ward Bolt & Nut
Co., Port Chester, N. Y.

NUTS—Thumb Malleable

Republic Steel Corp., Upson Nut Div.,
Cleveland, O.

Russell, Burdall & Ward Bolt & Nut
Co., Port Chester, N. Y.

NUTS—Wing

Parker-Kalon Corp., 195 Varick St.,
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OIL STONES

Carborundum Co., The, Niagara Falls,
N. Y.

OILS—Soluble—See Oils—Cutting

OILS—Cutting
Socony - Vacuum Corp., 26 Broadway,
N. Y. C.

Sun Oil Co., Philadelphia.

Tide Water Oil Sales Corp., 17 Battery
Place, N. Y. C.

OILS—Fuel

Socony - Vacuum Corp., 26 Broadway,
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Sun Oil Co., Philadelphia.

Tide Water Oil Sales Corp., 17 Battery
Place, N. Y. C.

OILS—Lubricating

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Tide Water Oil Sales Corp., 17 Battery
Place, N. Y. C.

ORES—Iron

Hanna Furnace Corp., The, Detroit, Mich.

Pickands, Mather & Co., Cleveland.

Shenango Furnace Co., Pittsburgh.

Snyder, W. P., & Co., Pittsburgh.

Ovens—Coke and By-Product Recovery
Koppers Construction Co., The, Pittsburgh.

Ovens—Core and Mold
Holcroft & Co., Detroit.

Ovens—Cross Regenerative
Koppers Construction Co., The, Pittsburgh.

Ovens—Enameling and Japanning
Carborundum Co., The, Perth Amboy, N. J.

OXY-ACETYLENE—Shape-Cutting Ma-
chines
Air Reduction Sales Co., 60 East 42nd
St., N. Y. C.

Linde Air Prods. Co., The, 30 East 42nd
St., N. Y. C.

OXYGEN

Air Reduction Sales Co., 60 East 42nd
St., N. Y. C.

Linde Air Prods. Co., The, 30 East 42nd
St., N. Y. C.

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PACKING—Metallie
Garlock Packing Co., The, Palmyra, N. Y.

PACKING—Rubber
Goodrich, B. F., Rubber Co., Akron, Ohio.

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Garlock Packing Co., The, Palmyra, N. Y.

PERFORATED METAL
Erdle Perforating Co., Rochester, N. Y.

Harrington & King Perforating Co., Chi.

Hendrick Mfg. Co., Carbondale, Pa.

Mundt, Chas., & Sons, 59 Fairmount Ave.,
Jersey City, N. J.

Wickwire Spencer Steel Co., 41 East 42nd
St., N. Y. C.

PHOSPHOR—Copper

Phosphor Bronze Smelting Co., Philadel-
phia.

PICKLING COMPOUNDS
American Chemical Paint Co., Ambler, Pa.

PICKLING MACHINES
Mesta Machine Co., Pittsburgh.

PICKLING TANK LINING
Cellcote Co., The, Cleveland, Ohio.

PICKLING TANK STEAM JETS
Duriron Co., Inc., The, 438 N. Findlay
St., Dayton, Ohio.

PIG IRON

Brooke, E. & G., Iron Co., Birdsboro, Pa.

Hanna Furnace Corp., The, Detroit, Mich.

Pickands, Mather & Co., Cleveland.

Republic Steel Corp., Youngstown, Ohio.

Shenango Furnace Co., Pittsburgh.

Shenango-Penn. Mold Co., Pittsburgh.

Tennessee Coal, Iron & Railroad Co.,
Birmingham, Ala.

PILING—Steel Pipe

National Tube Co., Pittsburgh.

PILING—Steel Sheet

Inland Steel Co., Chicago.

Jones & Laughlin Steel Corp., Pittsburgh.

PINIONS—Rolling Mill
Mesta Machine Co., Pittsburgh.

PINIONS—Wire and Rod
Rathbone, A. B. & J., Palmer, Mass.

PINS—Airbrake

Champion Rivet Co., Cleveland, Ohio.

PIPE—Cast Iron, B. & S. and Flanged
Wood, R. D. & Co., Philadelphia.

PIPE—Hammer Welded

National Tube Co., Pittsburgh.

PIPE—New and Second-Hand
Albert & Davidson Pipe Corp., 2nd Ave.,
50-51st St., Bklyn., N. Y.

Albert Pipe Supply Co., Inc., Berry and
N. 13th St., Bklyn., N. Y.

Fisher Bros. Steel Corp., Morris Ave. &
139th St., Bronx.

Greenpoint Iron & Pipe Co., Inc., 187-
197 Maspeth Ave., Bklyn., N. Y.

PIPE, STEEL—Rubber Lined
American Hard Rubber Co., 11 Mercer St.,
N. Y. C.

PIPE—Spiral Welded
American Rolling Mill Co., Middletown, O.

PIPE—Standard, Black and Galvanized
Jones & Laughlin Steel Corp., Pittsburgh.

National Tube Co., Pittsburgh.

Republic Steel Corp., Youngstown, Ohio.

Youngstown (Ohio) Sheet & Tube Co.

PIPE—Welded, Electric

National Tube Co., Pittsburgh.

Republic Steel Corp., Youngstown, Ohio.

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MACHINES
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Landis Mach. Co., Inc., Waynesboro, Pa.

Merrill Mfg. Co., Toledo.

Taylor-Wilson Mfg. Co., McKees Rocks, Pa.

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Alpha-Lux Co., Inc., The, 192 Front St.,
N. Y. C.

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Jarecki Mfg. Co., Erie, Pa.

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Taylor Forge & Pipe Works, Chicago.

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PLANING MACHINES—Second-Hand
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PLATE'S CLEANING COMPOUND
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PLATES—Floor or Ceiling
Deer

Alan Wood Steel Co., Conshohocken, Pa.

Carnegie Steel Co., Pittsburgh.

Central Iron & Steel Co., Harrisburg, Pa.

Inland Steel Co., Chicago.

PLATES—Heavy Steel (up to 25 in. thick)
Lukens Steel Co., Coatesville, Pa.

PLATES—Iron or Steel
Alan Wood Steel Co., Conshohocken, Pa.

American Rolling Mill Co., Middletown, O.

Bathlehem (Pa.) Steel Company.

Carnegie Steel Co., Pittsburgh.

Central Iron & Steel Co., Harrisburg, Pa.

Granite City (Ill.) Steel Co.

Hillside Steel Co., Chicago.

Inland Steel Co., Chicago.

Jones & Laughlin Steel Corp., Pittsburgh.

Lukens Steel Co., Coatesville, Pa.

Ryerson, Joseph T. & Sons, Inc., Chicago.

Tennessee Coal, Iron & Railroad Co.,
Birmingham, Ala.

Weirton (W. Va.) Steel Co.

Youngstown (Ohio) Sheet & Tube Co.

PLATES—Nickel-Clad Steel
Lukens Steel Co., Coatesville, Pa.

PLATES—Wide Steel (up to 199 in.)
Lukens Steel Co., Coatesville, Pa.

PLUGS—Core Hole

Hubbard, M. D., Spring Co., Pontiac,
Mich.

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Production Machine Co., Greenfield, Mass.

PRESSED METAL PARTS
Champion Sheet Metal Co., Inc., Courtland,
N. Y.

Crosby Co., The, Buffalo, N. Y.

Dickey-Grabler Co., Cleveland.

PRESSED STEEL PARTS
Crosby Co., The, Buffalo, N. Y.

Dickey-Grabler Co., Cleveland.

Geuder, Paeschke & Frey Co., Milwaukee.

Lansing (Mich.) Stamping Co., So. Penn
Ave.

Parish Pressed Steel Co., Reading, Pa.

PRESSES—Drop—See Hammers—Drop

PRESSES—Coining
National Mchry. Co., Tiffin, Ohio.

PRESSES—Foot
Baird Machine Co., Bridgeport, Conn.

PRESSES—Forging
Mesta Machine Co., Pittsburgh.

Morgan Engineering Co., Alliance, Ohio.

PRESSES—Forming and Bending
Dreis & Krump Mfg. Co., Chicago.

PRESSES—Friction Screw
Schatz Mfg. Co., The, Poughkeepsie, N. Y.

PRESSES—Hydraulic
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Farrel-Birmingham Co., Inc., Ansonia,
Conn.

Lake Erie Engrg. Corp., 68 Kenmore Sta.,
Buffalo, N. Y.

Mesta Machine Co., Pittsburgh.

Morgan Engineering Co., Alliance, O.

Wood, R. D. & Co., Philadelphia.

PRESSES—Power
Baird Machine Co., Bridgeport, Conn.

Dreis & Krump Mfg. Co., Chicago, Ill.

Farrel-Birmingham Co., Inc., Ansonia,
Conn.

Hyman, Joseph, & Sons, Phila.

New Albany (Ind.) Mch. Mfg. Co.

Niagara Machine & Tool Works, Buffalo,
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Schatz Mfg. Co., The, Poughkeepsie, N. Y.

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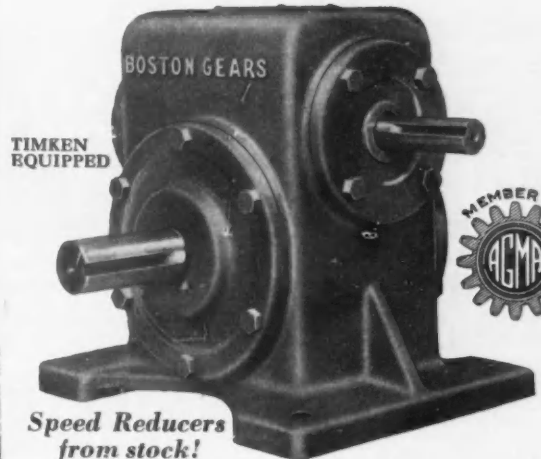
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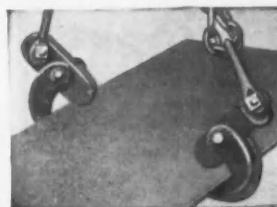
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Central Iron & Steel Co., Harrisburg, Pa.

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Reebing's, John A., Sons Co., Trenton,
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Nazel Engng. & Mch. Wks., Philadelphia.

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Baldwin-Southwark Corp., Southwark Div.,
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sion or Flat**
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Mich.

Lee Spring Co., Inc., 30 Main St., Brook-
lyn, N. Y.

Miller & Van Winkle, Inc., 18 Bridge St.,
Brooklyn, N. Y.

Raymond Mfg. Co., Corry, Pa.

Wickwire Spencer Steel Co., 41 East 42nd
St., N. Y. C.

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Boston Gear Wks., Inc., North Quincy,
Mass.

Diamond Chain & Mfg. Co., Indianapolis,
Ind.

Morse Chain Co., Ithaca, N. Y.

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Barnes-Gibson-Raymond, Inc., Detroit.

Barnes, Wallace, Co., The, Bristol Conn.

Champion Sheet Metal Co., Inc., Cortland,
N. Y.

Cook Spring Co. Div. of Barnes-Gibson-
Raymond, Inc., Ann Arbor, Mich.

Cook, H. C., Co., Ansonia, Conn.

Crosby Co., The, Buffalo, N. Y.

Cuyahoga Spring Co., Cleveland.

Dickey-Grabler Co., Cleveland.

Dunbar Bros. Co., Bristol, Conn.

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Mass.

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Geuder, Paschke & Frey Co., Milwaukee.

Gibson, Wm. D., Co., Chicago.

Globe Mch. & Stpg. Co., Cleveland.

Grammes, L. F., & Sons, Inc., Allen-
town, Pa.

Hubbard, M. D., Spring Co., Pontiac,
Mich.

Lansing (Mich.) Stamping Co., So. Penn
Ave.

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lyn, N. Y.

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Brooklyn, N. Y.

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Raymond Mfg. Co., Corry, Pa.

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cester, Mass.

Torrington (Ct.) Co.

Veeder-Root, Inc., Hartford, Ct.

Wiley & Lett, Inc., Marion, Ind.

Worcester (Mass.) Stamped Metal Co.

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Noble & Westbrook Mfg. Co., Hartford,
Ct.

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N. Y.

Wickwire Brothers, Cortland, N. Y.

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Duriron Co., Inc., The, 438 N. Findlay
St., Dayton, Ohio.

STEEL—Alloy
Alan Wood Steel Co., Conshohocken, Pa.

American Steel & Wire Co., Chicago.

Andrews Steel Co., The, Newport, Ky.

Bethlehem (Pa.) Steel Company.

Bissett Steel Co., The, Cleveland.

Carpenter Steel Co., 121 W. Bern St.,
Reading, Pa.

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Timken Roller Bearing Co., Canton, Ohio.

Vanadium-Alloys Steel Co., Latrobe, Pa.

Wheelock, Lovejoy & Co., Inc., Cambridge,
Mass.

STEEL—Alloy, Cold Drawn
Bliss & Laughlin, Inc., Harvey, Ill.

Moltrup Steel Products Co., Beaver Falls,
Pa.

Union Drawn Steel Co., Massillon, Ohio.

Wheelock, Lovejoy & Co., Inc., Cambridge,
Mass.

Wyckoff Drawn Steel Co., Ambridge, Pa.

STEEL—Bright Finished
Union Drawn Steel Co., Massillon, Ohio.

STEEL—Carbon
Andrews Steel Co., The, Newport, Ky.

Carnegie Steel Co., Pittsburgh.

Carpenter Steel Co., 121 W. Bern St.,
Reading, Pa.

Harrisburg (Pa.) Pipe & Pipe Bending Co.

Ingersoll Steel & Disc Co., Chicago.

Latrobe (Pa.) Electric Steel Co.

STEEL—Carbon Vanadium
Andrews Steel Co., The, Newport, Ky.
Latrobe (Pa.) Electric Steel Co.

STEEL—Chrome
American Steel & Wire Co., Chicago.
Andrews Steel Co., The, Newport, Ky.
Latrobe (Pa.) Electric Steel Co.

STEEL—Chrome Manganese
Latrobe (Pa.) Electric Steel Co.

STEEL—Chrome Nickel
American Steel & Wire Co., Chicago.
Andrews Steel Co., The, Newport, Ky.
Harrisburg (Pa.) Pipe & Pipe Bending Co.
Latrobe (Pa.) Electric Steel Co.

STEEL—Chrome Nickel Silver
Ingersoll Steel & Disc Co., Chicago.

STEEL—Chrome Vanadium
Andrews Steel Co., The, Newport, Ky.
Harrisburg (Pa.) Pipe & Pipe Bending Co.
Latrobe (Pa.) Electric Steel Co.

STEEL—Cold Drawn
American Steel & Wire Co., Chicago.
Bliss & Laughlin, Inc., Harvey, Ill.
Jones & Laughlin Steel Corp., Pittsburgh.
Moltrup Steel Products Co., Beaver Falls, Pa.

STEEL—Cold Rolled Strips
Acme Steel Co., Chicago.
American Steel & Wire Co., Chicago.
Athenia Steel Co., 135 William St., N. Y.
Griffin Mfg. Co., Erie, Pa.
Inland Steel Co., Chicago.
Latrobe (Pa.) Electric Steel Co.
Republic Steel Corp., Youngstown, Ohio.
Ryerson, Jos. T. & Son, Inc., Chicago.
Stanley Works, The, New Britain, Conn.
Steel & Tubes, Inc., Cleveland.
Superior Steel Corp., Grant Bldg., Pgh.
Thomas Steel Co., Warren, Ohio.
Weirton (W. Va.) Steel Co.
West Leechburg Steel Co., Pittsburgh.
Wetherill Bros. Co., Cambridge, 39, Mass.

STEEL—Cold Rolled Strips, Chrome Nickel
Acme Steel Co., Chicago.
Griffin Mfg. Co., Erie, Pa.

STEEL—Cold Rolled Strips, Electric Copper Coated
Thomas Steel Co., Warren, Ohio.

STEEL—Cold Rolled Strips, Electro-Galvanized
Thomas Steel Co., Warren, Ohio.

STEEL—Cold Rolled Strips, Electro Tin Coated
Thomas Steel Co., Warren, O.

STEEL—Corrosion Resisting
American Steel & Wire Co., Chicago.
Carpenter Steel Co., 121 W. Bern St., Reading, Pa.
Midvale Co., The, Nicetown, Phila., Pa.

STEEL—Crucible
Vanadium-Alloys Steel Co., Latrobe, Pa.

STEEL—Cutlery
Latrobe (Pa.) Electric Steel Co.
Ludlum Steel Co., Watervliet, N. Y.

STEEL—Die
Andrews Steel Co., The, Newport, Ky.
Carpenter Steel Co., 121 W. Bern St., Reading, Pa.
Diston, Henry, & Sons, Inc., Philadelphia.
Latrobe (Pa.) Electric Steel Co.
Ludlum Steel Co., Watervliet, N. Y.

STEEL—Drill
Latrobe (Pa.) Electric Steel Co.
Ludlum Steel Co., Watervliet, N. Y.

STEEL—Electric
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Inland Steel Co., Chicago.
Latrobe (Pa.) Electric Steel Co.
Ludlum Steel Co., Watervliet, N. Y.
Timken Roller Bearing Co., Canton, Ohio.
Timken Steel & Tube Co., The, Canton, O.
Wheelock, Lovejoy & Co., Inc., Cambridge, Mass.

STEEL—High Speed
Bethlehem (Pa.) Steel Company.
Carpenter Steel Co., 121 W. Bern St., Reading, Pa.
Ingersoll Steel & Disc Co., Chicago.
Latrobe (Pa.) Electric Steel Co.
Ludlum Steel Co., Watervliet, N. Y.
Vanadium-Alloys Steel Co., Latrobe, Pa.

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Illinois Steel Co., Chicago.
Inland Steel Co., Chicago.
Laclede Steel Co., St. Louis, Mo.
Latrobe (Pa.) Electric Steel Co.
Republic Steel Corp., Youngstown, Ohio.
Ryerson, Jos. T. & Son, Inc., Chicago.
Stanley Works, The, New Britain, Ct.
Steel & Tubes, Inc., Cleveland.
Superior Steel Corp., Grant Bldg., Pgh.
Weirton (W. Va.) Steel Co.
West Leechburg Steel Co., Pittsburgh.

STEEL—Hot Rolled Strips, Electro Zinc Coated
Thomas Steel Co., Warren, O.

STEEL—Magnet
Carpenter Steel Co., 121 W. Bern St., Reading, Pa.
Latrobe (Pa.) Electric Steel Co.

STEEL—Nickel
Andrews Steel Co., The, Newport, Ky.

STEEL—Open Hearth
Andrews Steel Co., The, Newport, Ky.
Pittsburgh (Pa.) Steel Co.
Timken Roller Bearing Co., Canton, Ohio.
Timken Steel & Tube Co., The, Canton, O.

STEEL—Rustless
Carpenter Steel Co., 121 W. Bern St., Reading, Pa.
Griffin Mfg. Co., Erie, Pa.
Latrobe (Pa.) Electric Steel Co.
Ludlum Steel Co., Watervliet, N. Y.

STEEL—Screw
Bliss & Laughlin, Inc., Harvey, Ill.
Timken Roller Bearing Co., Canton, Ohio.
Timken Steel & Tube Co., The, Canton, O.
Union Drawn Steel Co., Massillon, Ohio.
Wyckoff Drawn Steel Co., Ambridge, Pa.

STEEL—Special Analysis
Andrews Steel Co., The, Newport, Ky.
Carpenter Steel Co., 121 W. Bern St., Reading, Pa.
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Latrobe (Pa.) Electric Steel Co.
Ludlum Steel Co., Watervliet, N. Y.
Republic Steel Corp., Youngstown, Ohio.
Timken Roller Bearing Co., Canton, Ohio.
Timken Steel & Tube Co., The, Canton, O.
West Leechburg Steel Co., Pittsburgh.

STEEL—Spring
Athenia Steel Co., 135 William St., N. Y.
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Barnes, Wallace, Co., The, Bristol, Conn.
Gibson, Wm. D., Co., Chicago.
Republic Steel Corp., Youngstown, Ohio.
Timken Roller Bearing Co., Canton, Ohio.
Timken Steel & Tube Co., The, Canton, O.

STEEL—Stainless
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Bethlehem (Pa.) Steel Company.
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Carpenter Steel Co., 121 W. Bern St., Reading, Pa.
Diston, Henry, & Sons, Inc., Philadelphia.
Illinois Steel Co., Chicago.
Latrobe (Pa.) Electric Steel Co.
Ludlum Steel Co., Watervliet, N. Y.
Midvale Co., The, Nicetown, Phila., Pa.
Republic Steel Corp., Youngstown, Ohio.
Ryerson, Jos. T. & Son, Inc., Chicago.
Union Drawn Steel Co., Massillon, Ohio.
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Blisset Steel Co., The, Cleveland.
Carpenter Steel Co., 121 W. Bern St., Reading, Pa.
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Diston, Henry, & Sons, Inc., Philadelphia.
Ingersoll Steel & Disc Co., Chicago.
Latrobe (Pa.) Electric Steel Co.
Ludlum Steel Co., Watervliet, N. Y.
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Ryerson, Jos. T. & Son, Inc., Chicago.
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Wheelock, Lovejoy & Co., Inc., Cambridge, Mass.

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Detroit (Mich.) Alloy Steel Co.

STEEL—Tool, Special Shapes
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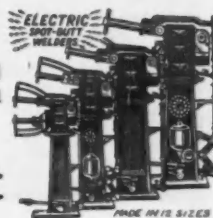
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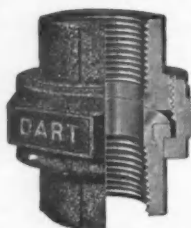
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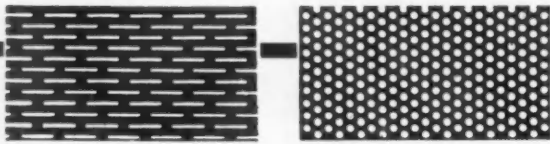
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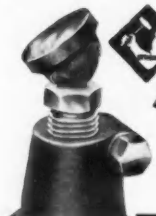
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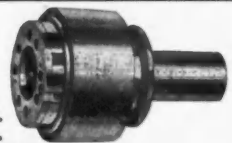
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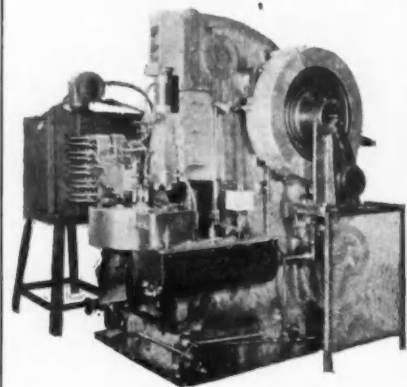
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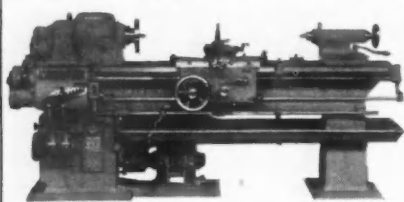
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WORLD WIDE

THE USE OF TIMKEN BEARINGS ON MILL ROLL NECKS

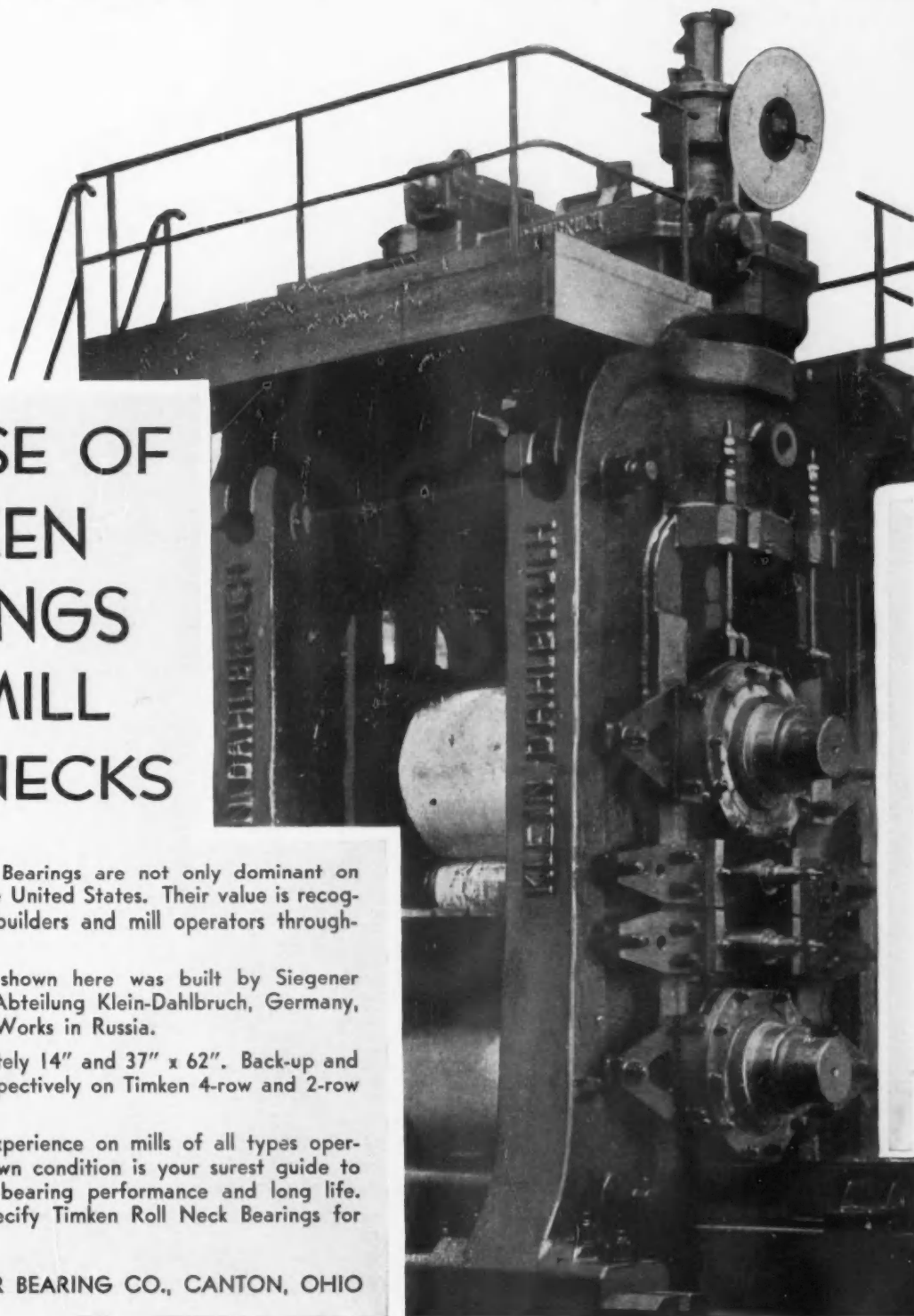
TIMKEN Roll Neck Bearings are not only dominant on mill roll necks in the United States. Their value is recognized equally by mill builders and mill operators throughout the world.

The 4-high cold mill shown here was built by Siegener Maschinenbau A. G. Abteilung Klein-Dahlbruch, Germany, for the Red October Works in Russia.

Size of mill, approximately 14" and 37" x 62". Back-up and work rolls mounted respectively on Timken 4-row and 2-row type bearings.

Timkens' world-wide experience on mills of all types operating under every known condition is your surest guide to dependable roll neck bearing performance and long life. It will pay you to specify Timken Roll Neck Bearings for old or new mills.

THE TIMKEN ROLLER BEARING CO., CANTON, OHIO



TIMKEN *Tapered Roller* BEARINGS

**A Standard of Quality
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THE YOUNGSTOWN SHEET AND TUBE CO.
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